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TABLE OF CONTENTS

FRONT COVER

This magnificent dovetail was a personal field find of Larry Kinney who lives near Lewistown in Logan County, Ohio. It's made of a heavily patinated Flint Ridge flint with shades of purple, yellow, cream and red. It was found from the seat of a tractor in the fall of 1981.

Editorial Page

The ugly spectre of fakery has again reared its head. Many members and some officers of our Society have expressed concern over this age-old problem and what to do about it. Despite the fact that we have done our utmost to educate our members and offered some of the best free advice available, collectors still get taken in. In fact, education is the one and only answer to fakes, fakers and fake sellers. When collectors either take the time required to become knowledgeable—which common sense dictates—in an area sometimes involving large amounts of money, or to seek the advice of those who do know, then the days of the faker and fake seller will be numbered.

Unfortunately, the role of our Society beyond the parameters of advice and education is limited. Our constitution is explicit concerning the sales of fakes among our members. To begin with, the buyer of a fake artifact must first lodge a complaint to our Board of Trustees. If the piece is determined to be fraudulent, the money must be returned or the seller will be expelled from our Society. That in essence is as far as we can become involved. If an accusation is made, the accused has every right to appear before our Board and defend himself and explain his side of the transaction thus assuring both parties their day in court. If it were not for this safeguard any number of unfounded accusations could be made. In all my years in this Society I have yet to see this provision of our constitution exercised.

Of course, there are laws on the books of most states concerning the sale of misrepresented objects. A number of states specifically cover the sale of antiquities. In addition, there is a federal law on the use of the mails to defraud. No one I know of has ever gone into court in the past twenty five years to seek civil redress against a faker. Such a case, if it ever came about, might do more to put fear into these unscrupulous people than anything else.

An additional facet of the fake business is the recent phenomenon of some collectors condemning a piece which is not in the least fraudulent. In many instances these rumor passers and originators, who apparently relish their sordid roles, are not themselves knowledgeable enough to pass opinion on anything. In this regard it is your Editor's opinion that it is time to stop the rumors and petty jealousy and get our Society back to our proper role of educating our members instead of trying to frighten them away from collecting.

An Adena Steatite Gorget

by
Jeff Carskadden, Zanesville, Ohio

The accompanying photograph (Fig. 1) illustrates a rare steatite gorget found by the author and James Morton in the course of excavating a Late Adena house site in Muskingum County, Ohio. The site is a hilltop locality overlooking the Muskingum River below Zanesville. This is the same hilltop where several Hopewell mounds and one Adena mound have been excavated (Foraker, 1975; Morton, 1977). The Adena house was found by accident during the excavation of one of the Hopewell mounds (Mound E) in the summer of 1975. Mound E overlapped the edge of the earlier Adena house site, and subsequent excavation beyond the limits of the mound revealed the complete pattern of a paired-post circular Late Adena house, 34 feet in diameter (Fig. 2). Additional Adena features such as refuse pits and hearths, as well as a sub-floor cremation burial with associated Adena artifacts, were found in and around this house pattern. In fact, the only definite Hopewell feature in the area was a central pit extending below the floor of the mound containing cremated human bone fragments and a number of Hopewell flint and slate objects. The entire Adena and Hopewell assemblages will be elaborated upon in later reports.

The pairing of the post holes, the occurrence of Adena Plain pottery, and Late Adena stone artifacts, indicate a late placement for the house site within the Adena occupation of the region. Complementing these late traits, a charcoal sample from one of the center posts of the house was radiocarbon dated at 210 B.C. ± 60 (TX-2374). The MASCA tree ring conversion for this date is 230-380 B.C. Nearly identical radiocarbon dates have come from other Late Adena sites in the Muskingum Valley (Bush, 1975; Greber, 1977).

The steatite gorget, along with the two smaller black shale or cannel coal gorgets also shown in Fig. 1, occurred as a "cache" in a small interior post hole near the central roof supports. This cache was just one of three similar pendant/gorget caches associated with post holes at the house site, and this association may indicate charms or offerings related to the construction of the house—perhaps offerings to household spirits or deities.

The gorget is fashioned from a light gray steatite and measures 10.5 cm long, 4.0 cm wide, and 1.4 cm thick. The edges are beveled or rounded and the holes are all drilled from both sides. The break is old, though both pieces were found together, and the third or central hole may represent an attempt at salvaging the larger of the two fragments into a new gorget.

This Muskingum County specimen is the first instance, that I know of, of Adena peoples in eastern Ohio using this material to fashion ornaments. Conversations with Bob Converse and James Murphy also failed to come up with any examples of Adena steatite ornaments. Gartley (1976) has summarized the occurrence of steatite cooking vessels from prehistoric sites in Ohio, and notes that steatite bowl sherds have been reported from three Adena mounds in the state, including mounds in nearby Hocking and Perry counties. At least one of these mounds, the Wright Mound in Hocking County, was probably a Late Adena site. Gartley notes that broken steatite pot fragments were often refashioned into gorgets on Late Archaic Transitional sites in New York and Pennsylvania. The Muskingum County example, however, exhibits no curvature which would suggest that it was originally from a vessel wall, unless the vessel was extremely large.

Steatite does not occur naturally in Ohio and the source for many Late Archaic steatite vessels may have been the eastern Piedmont and coastal regions (Seeman 1979:297-298; 1981), and this may be the source area for vessels from Adena sites in eastern Ohio, and perhaps this particular Muskingum County gorget. As can be seen in Fig. 1, however, the surface of the gorget appears rather rough and unfinished. It seems unusual that an unfinished gorget would be the object of trade, unless it was salvaged locally from a larger object (a pot) originally traded into the valley.

Gartley (1976) also reports two steatite vessel sherds from the 13th century Fort Ancient Philo II site in the valley below the mound group and Adena house site. These sherds were stray finds in refuse pits, and may relate to an earlier Adena occupation of the site. Steatite objects may prove to be more common on eastern Ohio Adena sites than previously thought.

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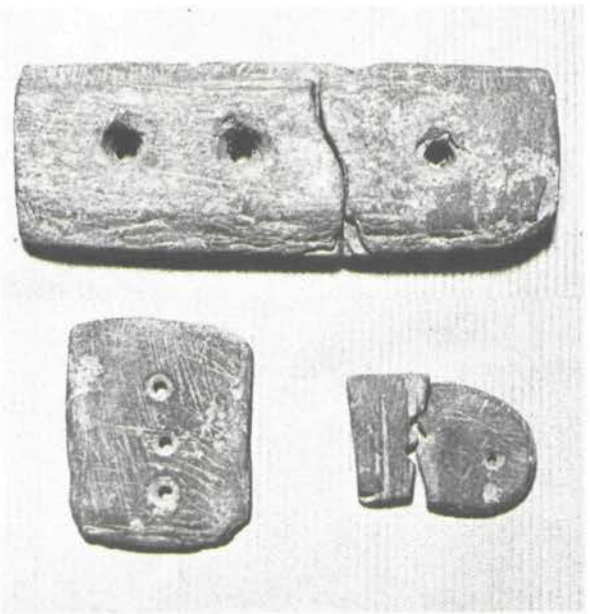

Fig. 1 (Carskadden) Gorget "cache" from the Late Adena house site, Muskingum County, Ohio. The largest one is fashioned from gray steatite.

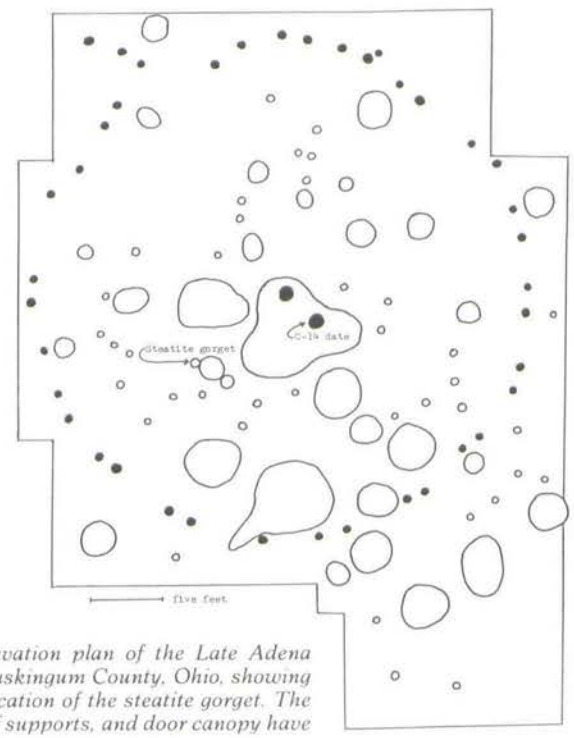

Fig. 2 (Carskadden) Excavation plan of the Late Adena house site (33-MU-77e), Muskingum County, Ohio, showing post holes, pits, and the location of the steatite gorget. The wall posts, two central roof supports, and door canopy have been darkened for this map.

We Can Help Each Other

by D. R. Gehlbach
3450 Sciotangy Road, Columbus, Ohio

"Let the buyer beware" is a tired but true cliche that especially applies to our hobby of collecting Indian Relics. How often have we heard the wise sage say, "don't purchase anything at auction or from another person without advice from an expert"? Although the writer previously wrote a short summary on the detection of fraudulent pipes (see Ohio Archaeologist volume 29 number 4) some additional comments are in order to help prevent further deterioration of a collecting interest that is so near and dear to many of our hearts.

First and foremost; when in doubt about the authenticity of an Indian Relic either *don't buy it* or at least seek the opinion of a knowledgeable collector of that *class* of artifacts. This advice is the best buy in today's inflationary economy because it's usually free. Second; get to know the characteristics of different raw materials that are used in crafting artifacts. As a rule harder rocks do not accept patina as readily as more porous substances. Therefore, an artifact made from a soft material such as sandstone will decompose if in contact with a foreign substance sometimes even for a very short period. Enter the faker. If the same soft material exhibits sharp or very precise lines, beware. On the other hand a harder more compact stone such as hematite may show little wear. Again ask the experienced collector about the expected amount of patina that will be deposited on different substances.

Ask the expert another question. Does this artifact have the right form, workmanship and is this the correct material? Be suspicious of highly polished pieces made from exotic or extremely colorful materials. Question rare or unique artifact forms. For example, Hopewell platform pipes demonstrate a consistent balance between stem and bowl dimensions in genuine examples. An uninformed collector may not notice lack of balance.

Beware of similar features on effigy forms. It is well known that the most eye catching and therefore most valuable forms were copied in the greatest numbers. Again ask the expert if he knows of copies of the piece you are interested in. Recently, the writer observed some ten bogus sandstone effigy pipes in a collector's cigar box. All exhibited the same facial features and each portrayed the same flaw in excavating the cavity of the bowl. They had been treated in an iron solution to duplicate the normal aging process. The frightening point is that had the pipes been shown individually they may have been judged as authentic based on their patination, but the expert would have noted the drilling flaw.

The contention of this article is that we, as a Society are interested in preserving our incentive for collecting Indian relics and must begin to openly share our experiences and knowledge. We should devote part of every state meeting and this fine publication to the education of our members on the identification of genuine artifacts. Short presentations at our meetings by knowledgeable collectors will help in our quest to learn more about authentic pieces. The reader's reaction to this suggestion would be appreciated.

Two Pipes From the Newcomerstown Area

by
Wayne A. Mortine, Newcomerstown, Ohio

This miniature Hopewell platform pipe (Figure 1) was found May 7, 1981, by James K. Tish, Newcomerstown, Ohio while surface hunting on a terrace of the Tuscarawas River in Lafayette Township, Coshocton County, Ohio. The site is located west of Newcomerstown.

The length of the pipe is 39mm; height, 19mm at the bowl. When first discovered in the field, it was green in color. This color was what attracted attention to the artifact as it was partially covered by dirt. At the present time, the green coloring is more apparent when the pipe is moistened. The material from which it is made is a very fine-grained stone and may be a form of Ohio pipestone.

The use of this miniature pipe is uncertain. It may have been a venerated object carried by its owner as an emblem of rank or prestige or it could have been made small specifically for a young member of the clan or group. Tish's theory is that it was made for use as a child's toy.

Whatever its use, it seems certain that smoking was not one of its functions. The evidence for this is that while the pipe, for all outward appearances is a finished product, the drilling for the stem does not penetrate into the bowl. We estimate that 2mm was all that was required to complete the stem drilling.

The pipe in Figure 2 is a conical, stemless, plain-bowl variety found while surface hunting May, 1968, by James K. Tish, Newcomerstown, Ohio. It was found on a terrace of the Tuscarawas River in Salem Township, Tuscarawas County. The location of the find is east of Newcomerstown, Ohio.

The height of the pipe is 32mm and it measures 20mm across the bowl. It is made from a fine-grained, lightweight, black stone. The material contains small crystalline particles which give the polished exterior of the pipe a shiny appearance. This stone could be black steatite, a material imported from the south. Gouge lines can be seen on the inside of the bowl indicating that this was the final step in the completion of the inside of the bowl. The stem aperture was countersunk into the lower part of the bowl.

The pipe belongs in the Late Mississippian time period, but because of the geographic location of the find in east central Ohio it would be difficult to place it into one of the major concurrent cultures. The Whittlesey or Erie indians were north of the area centered near Lake Erie. The sites and villages of the Monongahela people were to the east in the upper Ohio River Valley system, and the Fort Ancient culture was to the west and south. No doubt all of these groups of related peoples used the Tuscarawas River at one time or another in their activities and pursuits.

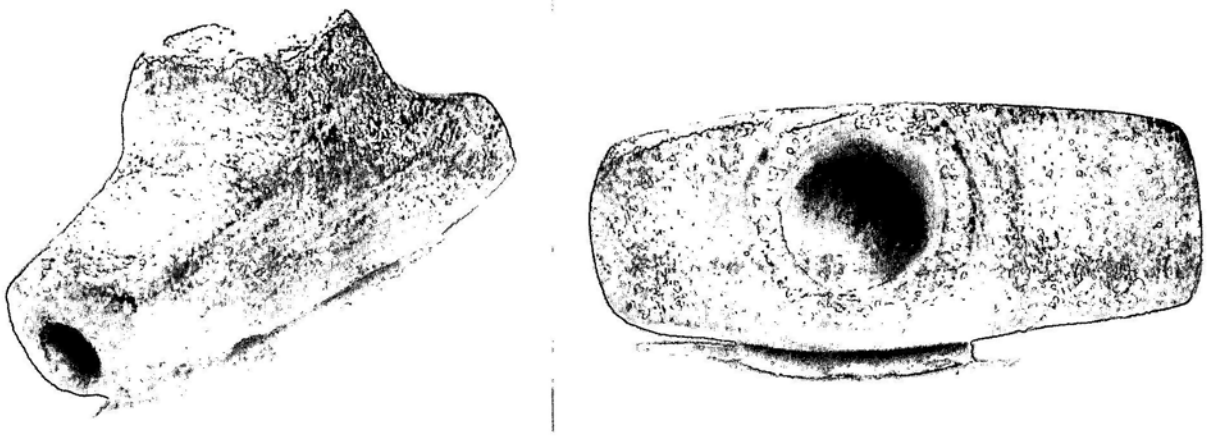

Fig. 1 (Mortine) Two views of a Hopewell platform pipe.

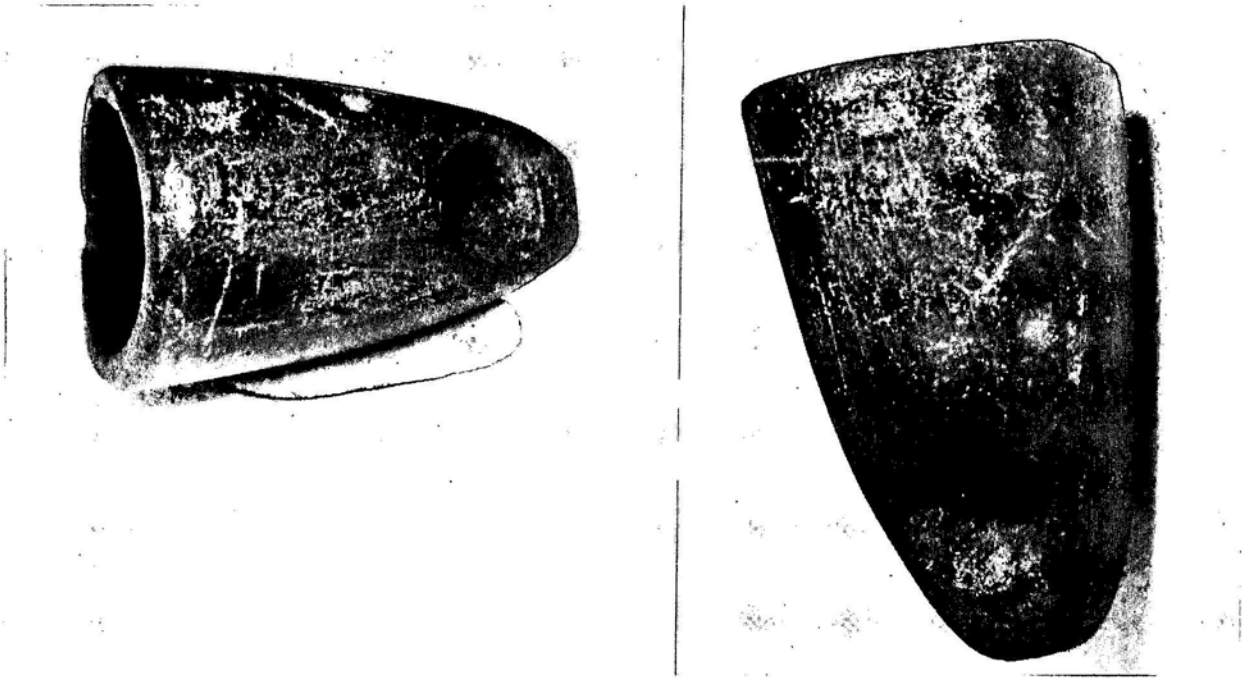

Fig. 2 (Mortine) Two views of a conical pipe, probably made of steatite.

The Vail Site: Newest Evidence of the Oldest Indians in the Northeast

by

Thomas C. Grubb
Mt. Vernon, O.

Edward W. Richard
Bolivar, O.

Richard H. Stambaugh
Canton, O.

Mystery still enshrouds the entrance of early man into the Americas and new facts or theories helping to explain the time and route of his entrance evoke profound interest among archaeologists and laymen alike. For years it has been believed that the first Americans crossed the landbridge (Beringia) from Asia and continued southward to South America. The approximate date of the crossing is still uncertain, ranging from 35,000 to 10,000 years ago. Their penetration routes into North America are still incompletely understood but as more paleo-Indian sites are discovered it may not be long before we can be more certain of their migration trails. However, one thing is certain; wherever the paleo-Indians traveled they left tell-tale evidence of their presence in the form of a unique and indestructible artifact—the fluted projectile point. It would seem a simple task to connect the places where these points have been found to at least suggest the direction of their migrations, but not enough pieces in the puzzle have yet been found. There is no doubt that they inhabited large areas in the southwestern states where several variations of fluted points have been found in some numbers many years ago, but only recently has the tell-tale artifact been reported in the northeast. Figure 1 shows the location of five paleo sites in the northeastern states beginning with the discovery of the Debert site in 1948 (MacDonald 1968). In 1981 Dumont listed 14 paleo sites that have been identified between Nova Scotia and New York state (Table I) and more recently the Whipple site in New Hampshire (Curran 1979) and the Vail site in Maine have been added. The latter site, to be described in this report, should be of special interest to Ohio archaeologists because the director of the Vail site excavation was Dr. Richard Michael Gramly who also was the site director of the Fort Laurens excavation (Gramly 1978) and two members of the Sugarcreek Valley chapter of the Ohio Archaeology Society, Edward Richard and Richard Stambaugh, spent two weeks in the summer of 1980 excavating the Vail site with him.

The story of the Vail site begins in 1979 when a fisherman and amateur mineralogist, Francis Vail, Jr. accidently stumbled upon an accumulation of Indian stone tools on the eastern shore of Lake Aziscohos created in 1911 by damming the Magalloway River near the common border of Maine, New Hampshire and Quebec. Vail traded the tools at a local rock shop where Gramly spotted a fluted point and asked the proprietor to introduce him to the one who had brought it in. Vail lead Gramly, who was then on the staff of the Maine State Museum, to the place where he had found the tools which Gramly immediately identified as a pure paleo site. Even this discovery would not have been exploitable were it not for the unusual combination of an abnormally low snowfall and the delayed spring rains in 1979 and 1980. This caused the water level to drop 22 feet and the shore to recede 100 feet thus exposing the paleo-Indian campsite beside the preglacial channel of the Magalloway River, an event which also happened 60 years ago. In the summers of 1979 and 1980 Gramly, who has become the Curator of Anthropology at the Buffalo Museum of Science, directed the site excavation. Incidently, members of the Sugarcreek Valley chapter visited the museum in August 1981 to view the Vail artifacts (Figure 2).

The location of the Vail site in the Longfellow Mountains of western Maine is characteristic of some of the northern paleo sites being situated near the narrowest point in the river valley where migrating caribou had to pass across the Megalloway River just 738 feet from the campsite and thus fell easy prey to the waiting Indians' spears (Figure 3). Since the winters are extremely cold reaching −50°F. with gales up to 90 knots, it is likely that the residents could only have lived there in the summers. The campsite covers about one acre with apparently 30 to 50 reoccupation dwelling areas as suggested by the debitage clusters which were probably inside some form of shelters. Only one of these clusters contained a firepit from which charcoal with a C_{14} date of 9,125 ± 180 B.C. was obtained. Because of silt deposits over much of the site most of the artifacts were found *in situ* exactly where they were originally deposited approximately 5 cm. below the surface.

A killing site was located 700 feet from the

campsite where ten fluted points but no butchering tools were found which Gramly interprets as indicating that animals no larger than caribou were slaughtered since butchering of larger animals would have required heavy cutting tools. It is to be noted that the habitation site was located downwind from the river crossing for obvious reasons.

In 1980 over 10,000 artifacts were collected which included 4,500 to 5,000 tools. Only lithic artifacts were recovered because the anaerobic decomposition of organic matter under water (producing humic acid—pH 4.5) probably destroyed any objects made of bone, shell or wood. The Vail Indians tool kit consisted of trianguloid endscrapers (44%), *pièces esquillées* (chisels) (17%), utilized flakes (13%), fluted bifaces (7%), side scrapers (6%), shaped gravers/denticulates (3%), flaked gravers/denticulates (3%), backed utilized flakes (3%), limaces (slug-shaped scrapers) (2%), bifaces (2%) and miscellaneous scrapers (1%), all made of grey, green or tan chert from outcrops 15 miles north of the site (Gramly and Rutledge 1981). Gramly emphasized that since the ratio of finished tools to flakes was approximately 1:1 it indicated that the occupants spent most of their time resharpening and regrinding their tools and weapons rather than making them *de novo;* while at the Debert and Whipple sites the ratio varied from 1:3 to 1:10. Figure 4 illustrates the various types of tools found at the site. The *pièces esquillées* resemble those found at Neolithic sites in Europe and were probably used to split bones to obtain the marrow. The limaces may have been used as "heavy duty" scrapers.

The most characteristic artifact made by the paleo-Indians was the fluted projectile point and Figure 5 shows what masters the Vail people were in making this exquisitely sculptured point. Their unreworked points ranged from 5 to 10.5 cm. long, 2.5 to 4 mm. wide and averaged 7 mm. thick. The unique character of these points at both the Vail and Debert sites was their deeply concave bases, one of the similarities between the two sites which Gramly considers as "sister sites", probably coeval. Figure 6 illustrates several sizes of typical fluted points and broken pieces with deeply cut concave bases. One other artifact shared by the sister sites was the fluted drill with a concave base shown in Figure 7. While it might be assumed that the drills were made from discarded projectile points, Gramly believes that this is unlikely due to their large numbers. Figure 8 shows another implement found in considerable numbers which was identified as a flaked graver/denticulate. Figure 9 illustrates the difference in size between the original and reworked fluted points. The reunited halves of the fluted points found in two different places are shown in this photograph.

The story of the Vail site excavation was gradually brought to a close at the end of October 1980 when the water level began to rise to its original height where it might remain for another 60 years. However, it did remain low long enough for Gramly and his coworkers to contribute another valuable piece to the puzzle of the paleo-Indians in northeastern America.

Acknowledgements:

The writers are greatly indebted to Dr. Gramly and the Buffalo Museum of Science for the photographs used in figures 3, 4 and 5 and to the magazine ARCHAEOLOGY for permission to reproduce the map in Figure 1. Our appreciation is also extended to the Archaeology of Eastern North America for permission to reprint Table I. Finally the writers wish to thank Dr. Gramly for much of the unpublished information he supplied as well as his help in reviewing this manuscript.

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Location	Radiocarbon date*
Debert, Nova Scotia	8,654 B.C.
Wapanucket 8, Mass.	nd
Bull Brook, Mass.	7,050 B.C.
Reagan, Vt.	nd
6LF21, Conn.	8,240 B.C.
Potts, N.Y.	nd
Davis, N.Y.	nd
West Athens Hill, N.Y.	nd
Kings Road, N.Y.	nd
Dutchess Quarry Dave, N.Y.	10,580 B.C.
Twin Fields, N.Y.	nd
Shawnee-Minisink, Pa.	8,640 B.C.
Port Mobile, N.Y.	nd
Plenge, N.J.	nd

*Dates converted from B.P. to B.C. omitting ± dates.
nd = no radiocarbon dates.

Table I (Grubb, Richard and Stambaugh) Location of 14 paleo-Indian sties in the northeastern United States with radiocarbon dates where available. (Table reproduced with permission of Archaeology of Eastern North America.)

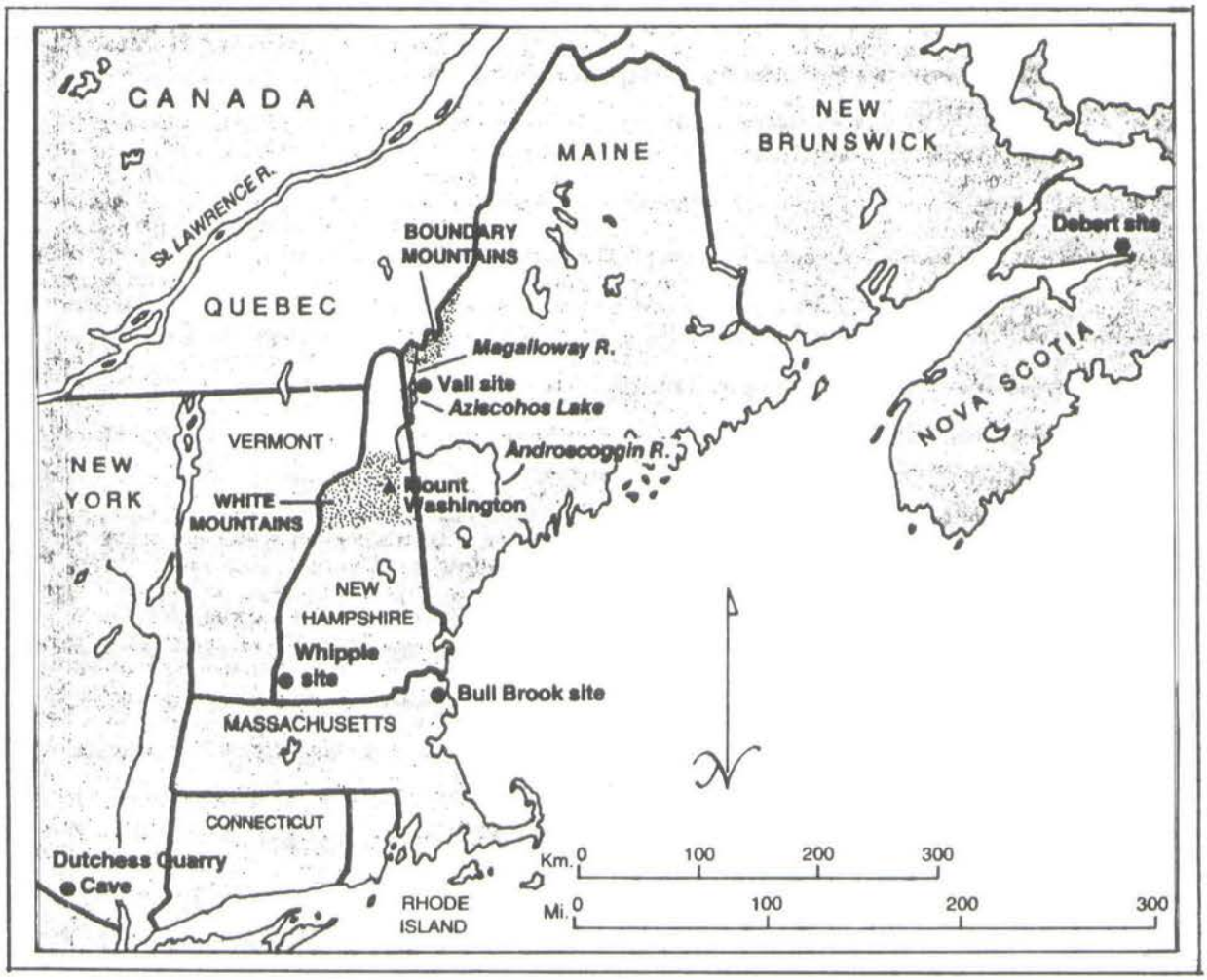

Fig. 1 (Grubb, Richard and Stambaugh) Location of the Debert, Vail, Whipple, Bull Brook and Dutchess Quarry Cave paleo-Indian sites in New England. (Map reproduced with permission of Archaeology magazine.)

Fig. 2 Dr. Gramly explaining the collection of Vail site artifacts at the Buffalo Museum of Science during a visit by members of the Sugarcreek Valley chapter of the Ohio Archaeological Society.

Fig. 3 (Grubb, Richard and Stambaugh) Excavation at one of the dwelling locations on the dry, sandy bottom of Aziscohos Lake with two archaeologists screening the soil. (Photograph courtesy of the Buffalo Museum of Science.)

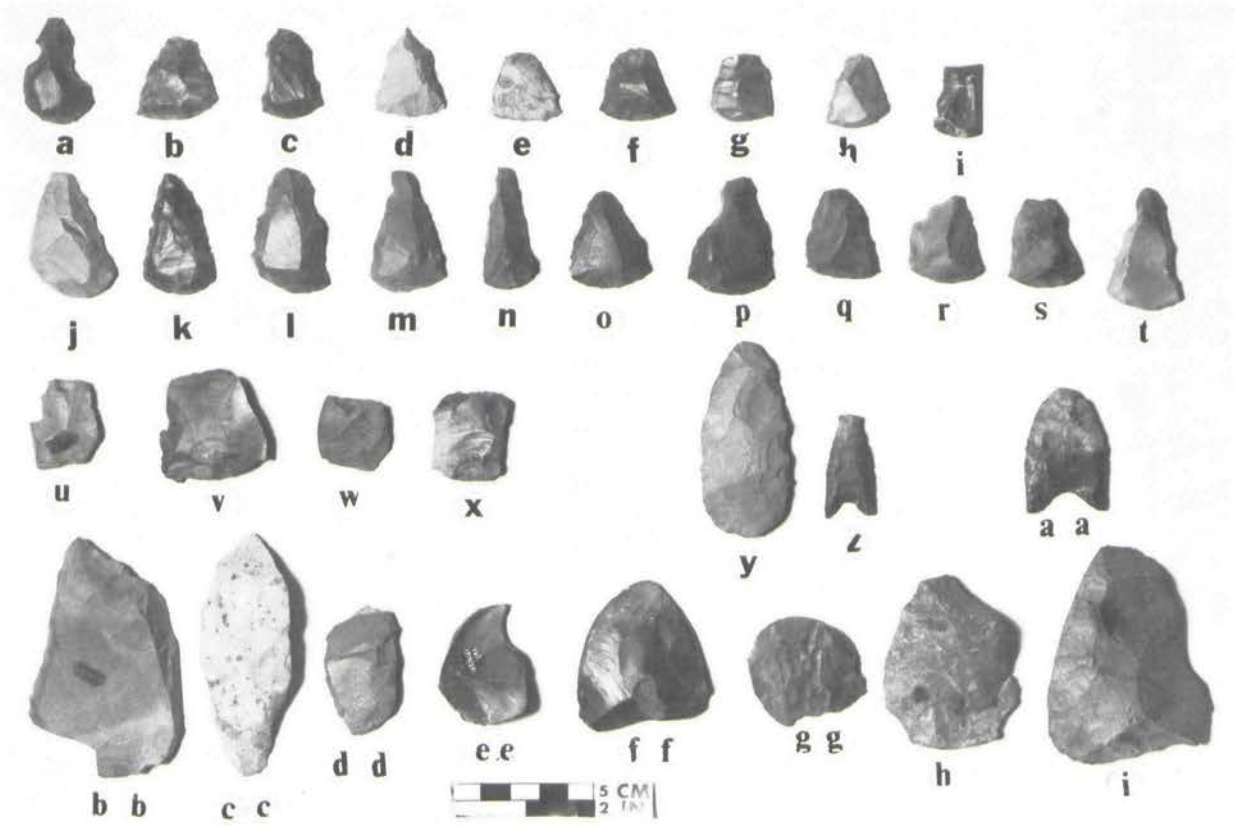

Fig. 4 (Grubb, Richard and Stambaugh) Various types of tools found at the Vail site: a - t, different types of trianguloid scrapers. u - x, pièces esquillées. y, oval biface. z, fluted drill. aa, extremely reworked fluted projectile point. bb - ii, various types of sidescrapers. (Photograph courtesy of the Buffalo Museum of Science.)

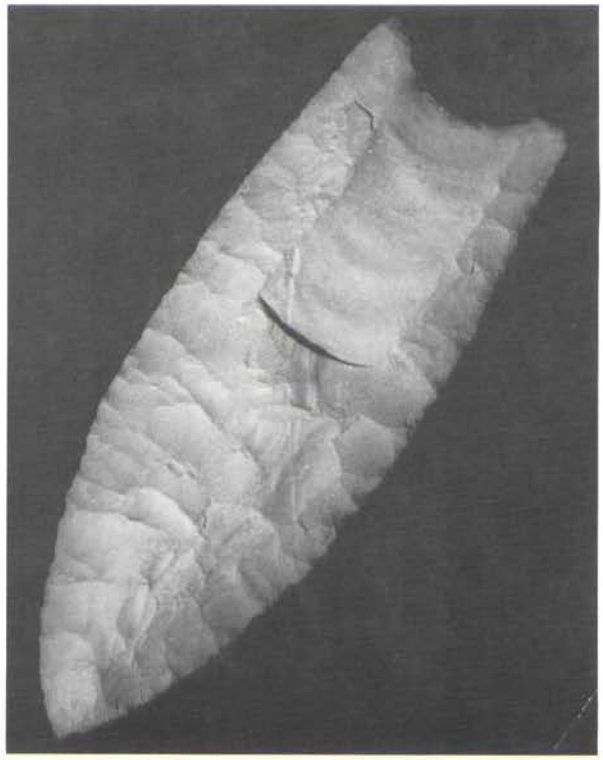

Fig. 5 (Grubb, Richard and Stambaugh) The largest complete fluted point measuring 108.5 cm. found on the Vail habitation and killing ground in 1980. It is laterally and basally ground but has a shallower basal concavity than most of the fluted points found there. (Photograph courtesy of the Buffalo Museum of Science.)

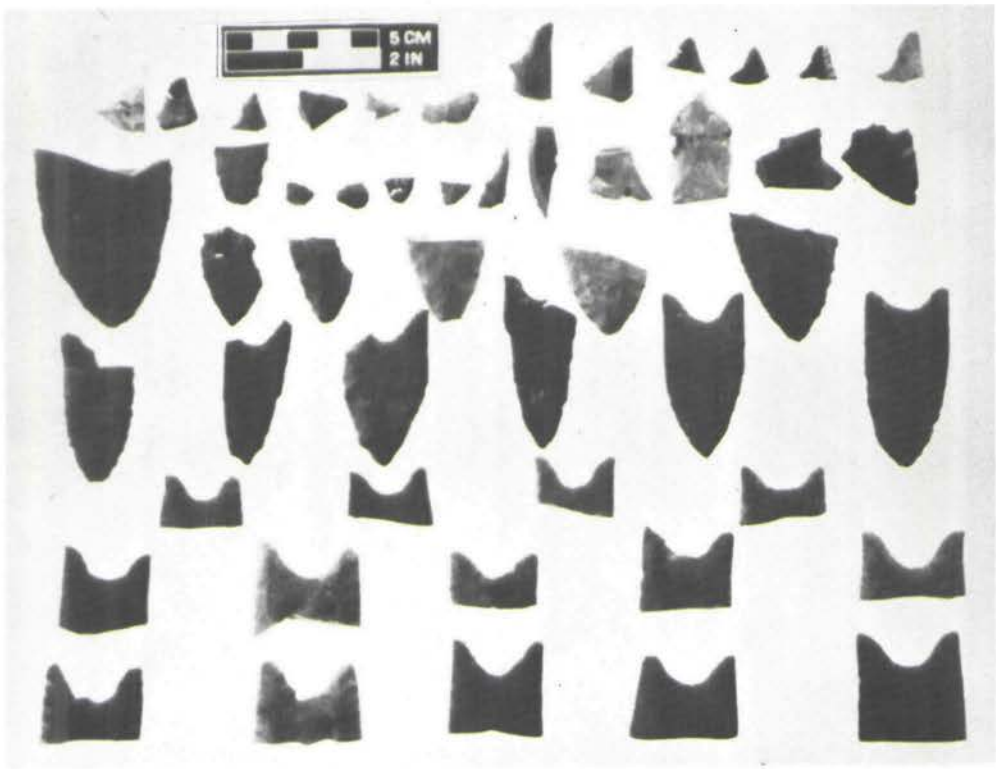

Fig. 6 (Grubb, Richard and Stambaugh) Broken and a few unbroken pieces of fluted points, all with deeply concave bases.

Fig. 7 (Grubb, Richard and Stambaugh) Representative drills with flutes and deeply concave bases.

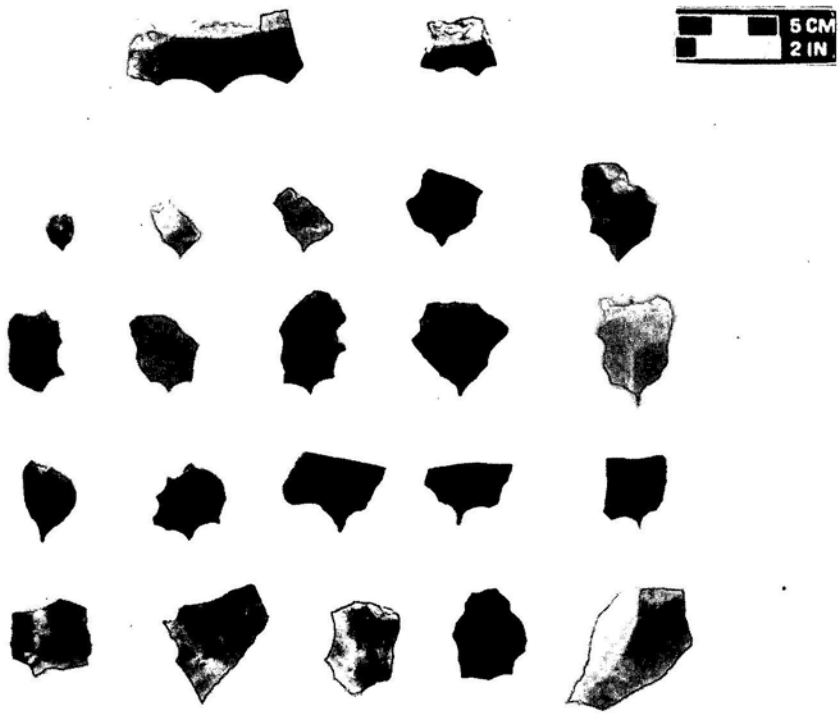

Fig. 8 (Grubb, Richard and Stambaugh) A selection of graver/denticulates.

Fig. 9 (Grubb, Richard and Stambaugh) Fluted points with characteristic deeply concave bases from the Vail site killing ground. Note the two lower points, one half of each was found at the killing grounds and the matching halves at the habitation site. (Gramly note: "Rarely in North American archaeology have points from separate sites been joined together".)

Why Dig?

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The sight of outstanding artifacts from archaeological excavations makes many of us yearn to "dig" a site. Such was the writer's temptation in the Spring of 1980.

Surface collecting from the two acre Burwell-Smith site in Northeastern Franklin County had during the previous six years yielded a sizeable amount of artifactual material. As of this writing (November 1981) approximately thirty-two accumulated hours of surface collecting has produced 218 worked pieces. Of the 75 identifiable pieces, 54 (72%) can be attributed to the Woodland tradition. See Figures 1, 2, 3 and 9.

Hopewellian occupation of this site is indicated by 28 typical Hopewell projectile points as well as by ten flake knives, three cores and an exceptional Type 1 Hopewell triangular blade. Hopewell accounts for 65% (35 of 54) of the Woodland material. See Figures 3 and 4.

Adena use of the site is evidenced by six typical Adena spearheads even though no typical Adena leaf blades have been found. See Figure 5.

Two examples of a long stemmed point with a spade shaped blade have been found on this site. The stem sides are ground on these specimens as they are on two others in the writer's collection. These points are probably late Archaic and may represent a new point type. See Figure 2 upper left corner, and Figure 4 upper right corner.

Other identifiable pre-Woodland artifacts include four Kirk corner notched (Broyles; 1971, pp 62-65), one Brewerton eared notched (Ritchie; 1971, p 17 and plate 5), what appears to be a Trimble side notched (Winters; 1969, pp 152-154 and plate 14), one Heavy Duty (Genessee) (Converse; 1973, p 47; Ritchie, 1961, p 24), three bifurcated points and three Charleston corner notched (Broyles 1971, pp 56-57.) See Figures 4 and 6. The Trimble side notched is in the lower left corner of Figure 4.

Late Woodland artifacts can not, with certainty, be recognized from the assemblage although a few pieces in Figure 3 may be post Hopewellian.

One lone Ft. Ancient arrowhead is all that has been found of the Mississippian tradition. See Figure 4. This scarcity seems strange in view of the historical evidence of Indian activities on the adjacent upland area.

Three celts, one adze, one grooved axe and the blade edge of a celt represent the stone tools from this site. See Fig. 7.

In light of the success in field searching, visions of leaf blade caches and platform pipes came to mind. In June of 1980, permission was secured for the Worthington Summer School archaeology class to conduct a dig at the site.

The resident, Mr. Claude Smith, being very interested in both the historic and prehistoric heritage of the property, was most helpful and cooperative.

The class, the writer and co-instructor Jim Gooding, dug and screened a total area of 44 square meters to a depth varying from 25 to 35 centimeters. The total time expended was forty hours with up to eighteen people involved at a time. Figure 8 shows why ample time existed for developing good excavation techniques.

Over 700 people/hours of effort produced the "grand total" of five (5) worked pieces. Comparing this with the results of field searching begs an answer to the question—Why Dig?

The answer is, of course, the very reason for field archaeology. Virtually all the chronological sequences, as well as life style and cultural process information has come from controlled excavations by trained and experienced people.

Surface collections, if properly catalogued, can provide much data as far as geographical distribution of various cultures is concerned, but can yield only a limited amount of information about cultural histories, life styles and processes.

It would seem then that to either acquire a collection or to gather cultural distribution information, field searching will produce the most for the least time involved. It also seems logical that excavations are best left to those among us who have the time, experience and training to properly conduct an excavation.

A special thanks to Mr. Claude Smith for permitting the field searching as well as the excavation. Mr. Ralph Barker kindly contributed artifactual material for this study, some of which appears in Figure 4.

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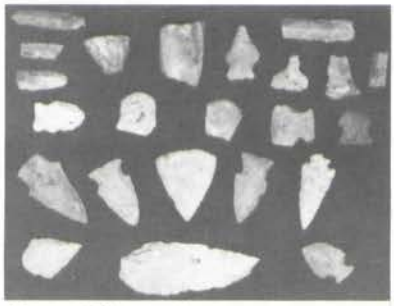

Fig. 1 (Hill) Woodland points and bladelets.

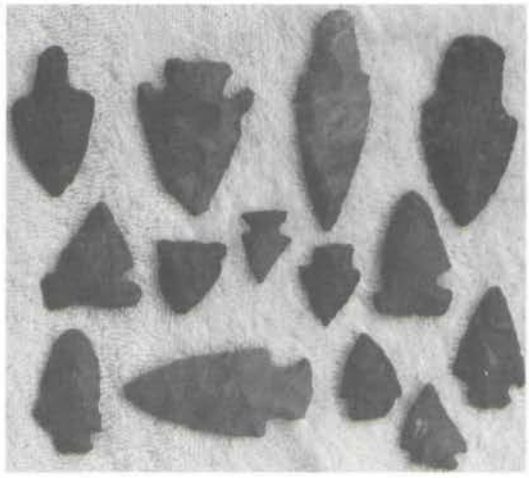

Fig. 2 (Hill) Various Woodland points and Archaic points.

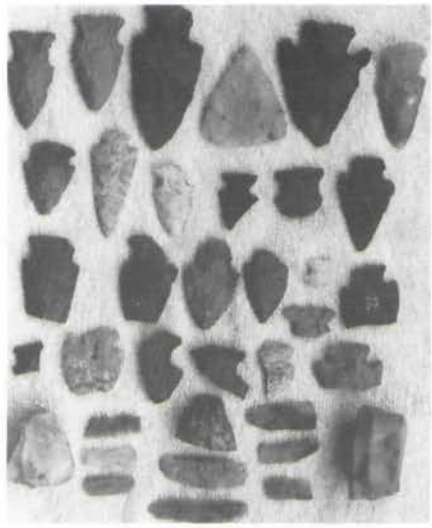

Fig. 3 (Hill) Hopewell and Middle Woodland pieces.

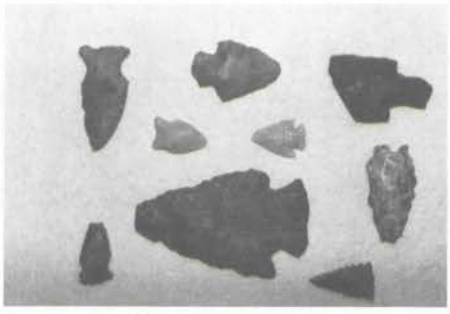

Fig. 4 (Hill) Various points from the site.

Fig. 5 (Hill) Adena points.

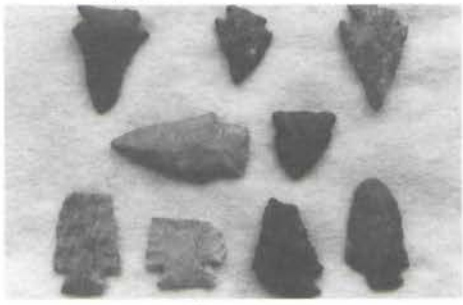

Fig. 6 (Hill) Archaic points.

Fig. 7 (Hill) Stone tools.

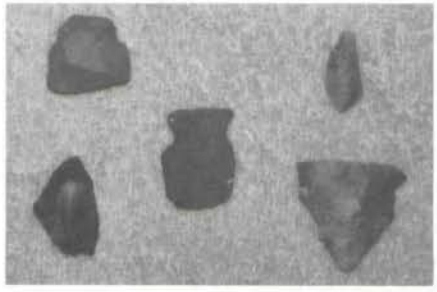

Fig. 8 (Hill) Various points and tools

Fig. 9 (Hill) Woodland points.

Artifacts From a Destroyed Mound, Dillon Reservoir Area

by
Elizabeth Reeb and Jeff Carskadden
Zanesville, Ohio

In the summer of 1981 a large mound in Licking Township, Muskingum County, was bulldozed flat by the property owner to make the site more suitable for housing. The mound was situated on a hilltop (el. 938 feet) overlooking the old Nashport-Irville area and Dillon Lake (see map, Fig. 1), on what was once the C. Sidle farm. Of all the mounds in Muskingum County, this structure was second in height only to the Nashport Mound located in the valley below. The Nashport Mound, an Adena site, was partially excavated by the Ohio Historical Society in 1975 (Greber, 1977).

The Sidle Mound measured (in 1917) more than twelve feet high, one hundred and ten feet north-south diameter, and eighty feet east-west diameter. (The Nashport Mound is about 15 feet high, 98 feet NS dia., and 79 feet EW dia.) Even though it was an imposing structure, the Sidle Mound was not recorded by early Muskingum County historian J. F. Everhart (1882), who mapped a number of mounds in the county, nor did it appear in William C. Mills' *Archaeological Atlas of Ohio* (1914). The mound was first brought to the attention of the Ohio Historical Society around 1918, when Clark Sturtz, a Zanesville bicycle repairman and amateur archaeologist, sent a number of photographs of Muskingum County mounds to the Society (Carskadden n.d.). Sturtz's badly faded photograph of the Sidle Mound, his site No. 53, taken November 29, 1917, is reproduced in Fig. 2. Sturtz noted on the back of the photo that a large hole had been dug in the center and that the structure was originally probably several feet higher. He also noted a 48 inch diameter chestnut stump on the mound.

The mound was "rediscovered" in 1971 and was noted in a preliminary archaeological survey of the lower Licking River Valley (Carskadden, 1971). At that time the site was given the registration number 33-Mu-16. It was also noted in this report that the mound had been partially explored by the landowner in the 1960's and that a rolled copper bracelet was supposedly found around a human arm bone. At the time of the 1971 survey the mound and hillsides immediately surrounding it were covered with undergrowth. Houses were located on the periphery of the hill. The mound was probed again, probably in the early to mid 1970's when the entire north side of the structure was bulldozed away, leaving a crescent-shaped remnant. It is not known what if anything was found at this time, except that many large pieces of sandstone were noted in the spoil dirt.

In the spring or summer of 1981 the present owner completely leveled the site, and area residents report that bulldozing uncovered five extended burials lying at or near the mound floor. These burials had been covered by a "primary mound" of dark earth, which in turn was covered by a three foot (?) thick layer of large sandstone boulders. A secondary mound of earth had been placed over this layer of stones. Reportedly no artifacts were associated with the burials.

The accompanying photographs (Figs. 3 and 4) illustrate flint artifacts and human bones washed out by rains from the bulldozed earth at the mound site and found by individuals living nearby. The flint artifacts include both Early and Late Adena projectile points and "cache blades", along with Archaic preform fragments and two Late Woodland or Late Prehistoric triangles, probably from the surface of the mound or surrounding hilltop. Another local resident found a second C-shaped copper bracelet in the disturbed earth using a metal detector. This artifact is illustrated in Fig. 5.

The two copper bracelets from the Sidle Mound, along with at least one Robbins point fragment, would indicate that at least the upper stages of the mound were constructed in Late Adena times. Radiocarbon chronology and comparative data from areas suggest that Adena peoples may have inhabited the Muskingum Valley from 700 B.C. to as late as A.D. 50, with dates from most Late Adena "Robbins Complex" sites clustering around 350-200 B.C. (Mortine and Randles, 1981:21). Greber states that the midpoint of her four radiocarbon dates and probable time for the Nashport Mound construction is about 200 B.C. Adena peoples appear to have abandoned many of their hinterland and hilltop settlements by Late Adena times and began frequenting the terraces and bottomlands along the larger rivers and streams, at least in the Scioto and

Hocking valleys (Black, 1979). If this trend holds true for the Licking Valley, then one would expect the Sidle Mound to have been constructed before the Nashport Mound—before 200 B.C. On the other hand, it has been suggested that some of the Adena hilltop mounds, particularly those of stone or partial stone construction, may be confined to the last stages of the Adena time span—perhaps a late "degenerate" Adena (see Dragoo, in Murphy, 1975:131).

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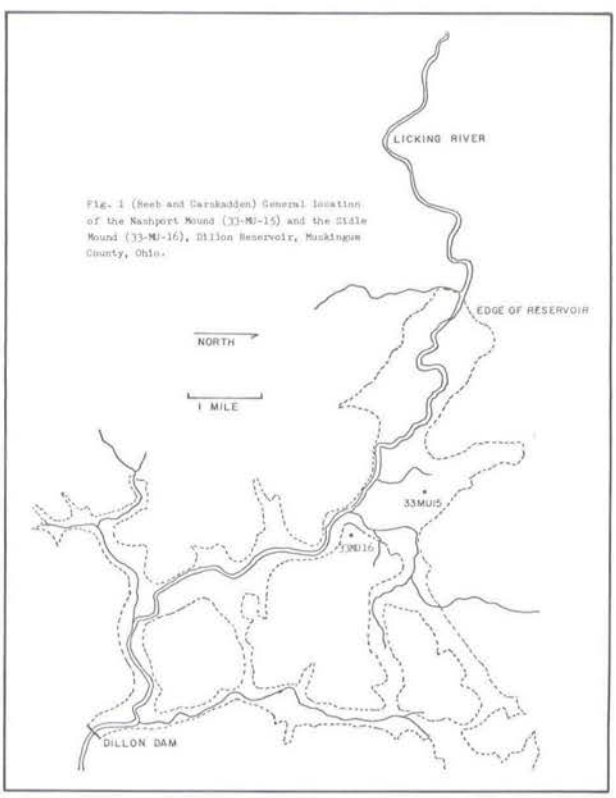

Fig. 1 (Reeb and Carskadden) General location of the Nashport Mound (33-MU-15) and the Sidle Mound (33-MU-16). Dillon Reservoir, Muskingum County, Ohio.

Fig. 2 (Reeb and Carskadden) Clark Sturtz's 1917 photograph of the Sidle Mound, Dillon Reservoir area, Muskingum County, Ohio.

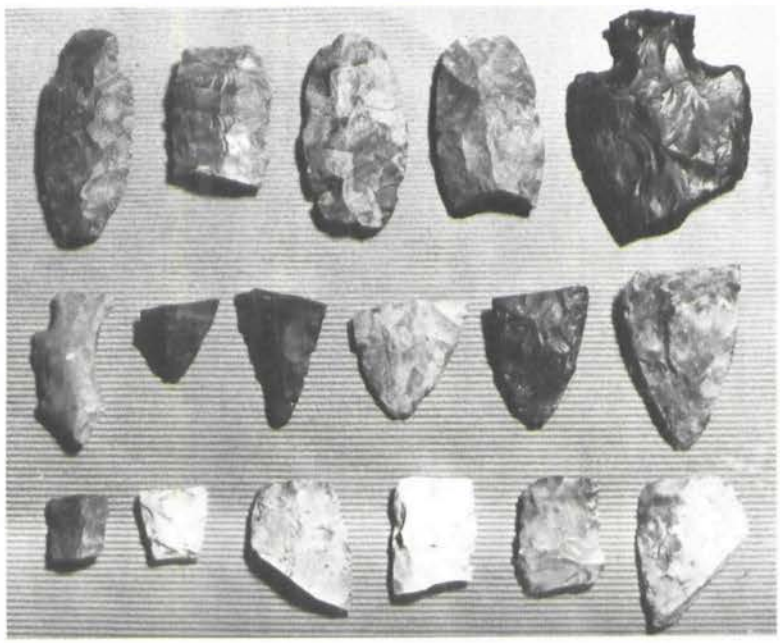

Fig. 3 (Reeb and Carskadden) Flint artifacts from the site of the Sidle Mound, Dillon Reservoir area, Muskingum County, Ohio.

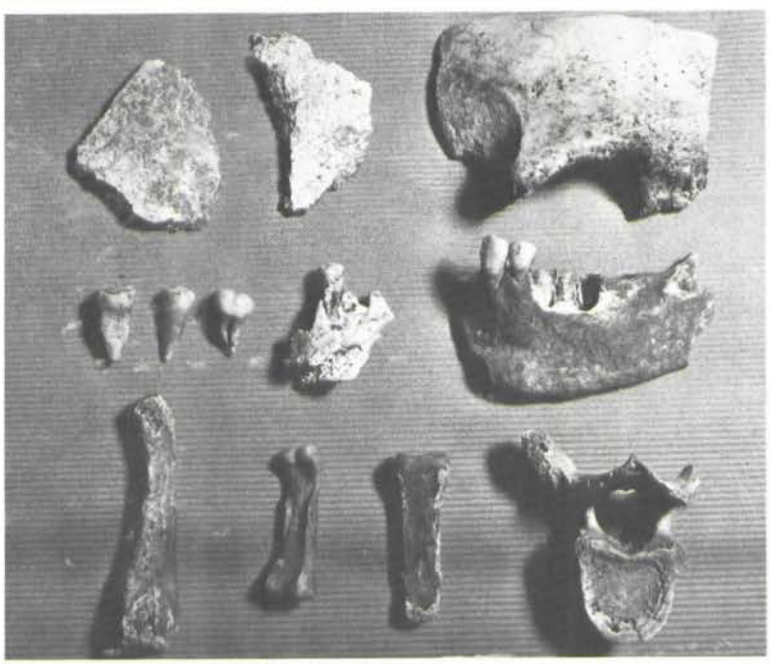

Fig. 4 (Reeb and Carskadden) Human bone fragments from the site of the Sidle Mound, Dillon Reservoir area, Muskingum County, Ohio.

Fig. 5 (Reeb and Carskadden) Copper bracelet found with a metal detector at the site of the Sidle Mound, Dillon Reservoir area, Muskingum County, Ohio.

Fake Artifacts

by
Col. Raymond C. Vietzen

In compiling this second chapter relating to the fake Indian artifacts, I have decided to focus on the many newly produced flint knives and spear points which have flooded America. Many of these modern creations are beautiful to behold and some are as intricate and expertly chipped as many of the ancient specimens created by prehistoric American Indians. Yes, I have bought several for study and have found fault with many but I was shockingly surprised by the fine workmanship on others, as well as, the beautifully colored materials used in their manufacture.

There are many of our artifact collectors who set themselves up as experts and some of these learned men will point out how this flaking, or that technique, is wrong and was not used by this or that culture. The truth is that individuals followed different methods and varied greatly in chipping their products. We can not place all prehistoric flint chippers in one category and we should not try to do so.

Salvage and resharpening changed many specimens and made their appearance as if two or more flint knappers were involved, and perhaps this is exactly what took place. Even a son or grandson could vary and change his father's technique.

The late Don Boudeman, an advanced collector, and several others once paid a man to seek out the source of the large modern flint specimens and if possible to find the maker, with the thought of prosecution in mind and perhaps to stop their manufacture. A fund of $500.00 was set up, with a promise of more, if needed and the hunter was sent on his mission.

The searcher, a friend of mine, and a sharp man, was sent on his way, which took him to Arkansas and the Southwest. Here he talked to relic dealers who handled these large flint creations but none would tell him who made the products. All the dealers claimed the maker delivered them in person taking cash and leaving no name or address. Knowing these men were lying through their teeth, our hunter questioned one at great length, finally making him so mad he blurted out, "Of course they are made in Texas, where in hell do you think the hornstone comes from"?

Just by luck our hero chose a small town in Texas, no more than 750 population, for his first stop. Here, as he entered the sleepy, country town and inquired of an elderly man who was crossing the street. "Sir", he said, "Can you tell me where the man lives who makes the large Indian spears." The kindly old gent said, "I sho can, he lives right beside me." He gave the street and number, but added, "Maybe he ain't home now but you all wait a while and he'll be thar." The house was located but there was no answer at the front door so the back door was tried with no luck. Seeing a shop door open and two large piles of flint chips in the back yard, our hunter summoned enough courage to look in the shop where chipping equipment was being used. Spearheads, both finished and rough chipped were lying on the workbench.

Just as our white knight was deeply engrossed in the operation a voice said, "Well, what in hell are you looking for"? The answer was, "I want to buy some of your big spearheads." The faker said, "If you have the money you sure as hell can buy a truck load." At $3.00 a piece, several hundred were purchased, after which a tour of the shop was in order. A diamond saw and a mason's saw were used for slabbing and shaping. A small air compressor operated an oscilating chipping tool which took off flakes as fast as one could work it. At times an antler chipping tool was used to finish the fine secondary work. A small sandblast could be used with care to dull and age the fresh chipped areas. Polishing wheels also played their part in aging the specimens. A few mishaps occurred but the breakage was held to a minimum.

Armed with the evidence, the next move was back home to Kalamazoo, Michigan where his employers were waiting. The intent was to prosecute the faker and stop his operation but this could not be done. The artisan did not sell his creations as prehistoric Indian relics but only as spearheads so there was no grounds for his arrest and convictions. Like a fine cabinet maker creating reproductions of antiques, he was in a legitimate and lucrative enterprise.

I have withheld names of persons and places to eliminate any legal entanglements but these are on file. The buyer must be on guard and in some instances he is as guilty as the faker. If you do not buy the faker's products he cannot stay in business for any length of time. Let's face it some specimens are very beautiful and many collectors want art objects more than they want genuine, old, ugly

artifacts for study. I would rather have a study piece than just a piece of prehistoric art. Surely, I like fine specimens but do not let your love for beauty warp your good judgement.

Many of these large flints are dark gray to black in color—these are usually the longest produced. Some creamy, white and light gray does appear in blades of great length. I have seen nearly white blades as long as fourteen inches. Such forms often have intricate notches and serrations along the edges.

Those blades made of beautiful colored material are apt to come in shorter forms, perhaps because the more colorful raw material was not available in long slabs. Some of the most attractive I have viewed have small teardrop spots of blood red spattered throughout a dark gray background. These somewhat resemble bloodstone as found at the foot of the cross where Christ was crucified. Some pink and white short spearheads are to be had but these are few in number. Usually, this is novaculite from the Arkansas area. This is a silicious and very fine grained rock which cuts or chips well and does make a very pleasing projectile point whether made by prehistoric Indians or modern white man.

A few small Dalton points have reached the market but these do not bring a big enough price to make it profitable to manufacture such forms. Actually, the makers of these reproductions are not the ones reaping the huge profits. The artifact dealers are guilty of harvesting the profits. At one time, I could buy large flints for $3.50, which were being sold at $50.00 to $100.00 by unscrupulous dealers and it is no one's fault but the buyer who should not be in the field if he knows not what he is doing. If the water is too deep, stay on shore. They used to say a fool is born every minute but today there are at least two every minute.

At least the spearheads are attractive and when framed make nice wall decorations and good conversation pieces.

Fakes are an enigma for which I have no solution and surely these are an iniquity and not a boon to the legitimate collector.

Remember the man who takes the dope is as guilty as he who sells it.

Many actions of man are unethical but not illegal, not dishonest but unscrupulous. Yes, I ride a white horse but I am not the White Knight.

Historical Evidence For the Use of Birdstones

by
James M. Brown
Norwalk, Ohio

Several years ago my father, knowing my interest in the American Indian, showed me an article in *Man Myth & Magic* on Algonquin Indians (Burland 1974: 61-63). The author, C. A. Burland, is a specialist in the arts and religions of primitive people and author of *North American Indian Mythology* (Burland 1965). Illustrations in the article are by John White, a 16th century painter who met these Algonquin speaking Indians in Virginia. He left an invaluable collection of paintings of these Indians and their way of life.

One painting is particularly interesting, 'The Flyer', an Algonquin medicine-man. He is pictured acting like a bird, magically aided by a dried bird attached to his hair, and by the charms he carried in the pouch tucked in his belt. In his dance he rises from the earth to the world of the manitous (spirit beings) where he will return bringing messages to the people. The Algonquins believed that human contact with the unseen powers came through their medicine-men, who were intermediaries between the people and the spirits (Burland 1974:61).

The Great Lakes area, which is the heartland of the birdstone, was inhabited by many Algonquin-speaking tribes when the first white men entered the area. For how many centuries before is unknown, though probably as far back as the Archaic period (Hyde 1973:3). Birdstones are known to date from the Late Archaic to Early Woodland period, at least 2,000 years before John White witnessed this ceremony and recorded it in his painting. It is possible though, to believe this ceremony was centuries old at the time he saw it.

There have been many theories over the years for the use of birdstones, with many collectors believing they had some kind of religious significance (Parks 1975: 23-28). In my opinion they were worn by the village medicine-man during certain ceremonies to make contact with the spirit world, just as the dried bird was used on 'The Flyer'.

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Fig. 1 (Brown) "The Flyer", an Algonquin medicine man, from a 16th century painting by John White in the Smithsonian Museum. Note the dried bird attached to his hair. The medicine bag on his belt carried magic charms.

Heavy Duty Points

By Robert N. Converse, Plain City, Ohio

A point type often overlooked and neglected by collectors is the heavy duty point. It can be included with other highly collectable classic Ohio types such as the dovetail, fractured base, pentagonal, Adena, Hopewell etc. when all its characteristics are considered. It nearly always displays the qualities of outstanding workmanship, size, scarcity and recognizability—those attributes which seem to motivate collectors. Yet the heavy duty type is not as sought after as many other types and may well prove to be an inexpensive addition to anyone's collection. Perhaps rarity is a factor in its seeming lack of popularity since numbers of good examples have not often appeared in the many recent auctions. However, a group of fine heavy duty points, such as those shown in the accompanying color plate, presents a pleasing appearance which would grace any collection.

Little is known from an archaeological standpoint about this type. It is undoubtedly Archaic in origin and displays the characteristics and chipping techniques of that period. The stem is heavily ground, especially the sides, and thick in cross-section (hence the name heavy duty). Almost without fail there will be two or three triangular shaped thinning flakes directed downward on one or both faces of the stem and these thinning flakes may sometimes result in a somewhat indented base. It is in the heavy blade and its chipping that the student can see some of the finest flint work in Ohio. Some of the extended narrow pressure flakes, seemingly no more than an eighth of an inch wide and nearly an inch long, curve gracefully over the face of the blade and give it a smooth and symmetric countour from end to end. This blade treatment is, in the author's opinion, among the most outstanding examples of prehistoric flint technology and surpasses that of nearly any in Ohio and perhaps the world. There can be little doubt after examining a number of finely made heavy duty points that the flint knappers who made them exercised complete and total mastery over both the technique and the stone they were working.

High quality black Upper Mercer flint, especially that from the Zaleski deposits, is preponderant in the type. Occasionally, local cherts were employed but these are usually of better than average quality. Rarely, non-colorful Flint Ridge chalcedony is present, the colorful varieties of Flint Ridge stone being exceptionally scarce. Indiana hornstone, the high quality material from southern Indiana is not uncommon in the type and other extraneous flints were seldom used.

In size the heavy duty rarely exceeds the four inch limits in length but, on the other hand, examples less than two and one half inches are not common. The smaller varieties of this type fall into the serrated category and may be reworked from larger pieces, however, many of these smaller specimens appear to have been made deliberately.

This point type should not be confused with Adena points. In outline they are shaped somewhat like early Adena types but these are thicker in cross-section with much better chipping. The stem will be square or somewhat indented as compared to the rounded design of early Adenas.

Fig. 1 (Converse) Heavy duty points from the collection of Ernie and Dorothy Good, Grove City, Ohio. The point in the center is of Indiana hornstone, the dark spot in the blade being the center of the nodule. The black points are all of Zaleski flint.

Grooved hammerstones are not uncommon in Ohio, yet seldom are they found in undamaged condition or symmetric shape. These fine specimens combine an additional quality of colorful material as well as shaped and condition. Quartz, granite, gneiss and slate are some of the materials.

Colorful slate pieces from the collection of Ernie and Dorothy Good of Grove City, Ohio. In the upper row are two expanded center Adena gorgets of red slate. The large pendant center top and the two pendants in the bottom row are all of unusual stone.

Fig. 1 (Converse) Burins from the Editor's collection. Top row—Archaic side notch—Middle Woodland—serrated corner notch. Middle row—two Middle Woodland points—bottleneck point. Bottom row—two Middle Woodland points. Bottleneck point is burin faceted on the stem as well as the blade.

Burins

By Robert N. Converse, Plain City, Ohio

The word burin comes from the French and is a name for a kind of engraving tool. This same name was applied to flint tools with similar graving edges found in Europe by 19th century archaeologists. It is known today that these burins—over twenty types have been defined—originated in the Upper Paleolithic in Europe, Africa and Asia. They are among the oldest tools in the history of man and whole paleolithic cultures are recognized by the various burins they manufactured. Strangely, burins had been in use for thousands of years before the first notched stone projectile points were invented. Even more unusual, in the writers opinion, is the fact that such a sophisticated and refined flint working technique was discovered and used so early in man's ancient history.

When the spate of north American paleolithic finds were made in this century, archaeologists looked in vain for burins or burin-like tools among the paleo flint assemblages, but none were to be found. It is now known that the New World equivalent of Europe's Upper Paleolithic—the paleo-Indian, did not use burins, or if they did they have yet to be found.

However, even though burins are not found in the American paleolithic, they do occur in almost all succeeding cultures in forms somewhat different from their European counterparts. In addition, the prehistoric Indian flint knappers carried the burin technique to further sophistication by applying the technique to the design of many projectile points and in fact making it in integral characteristic of some types. Points such as the fractured base, some bifurcates, occasional rare dovetails and Middle Woodland points employed burin techniques to one degree or another.

I have never seen a New World burin which was an intentionally fashioned and designed tool since it seems all of our burins are made from broken projectile points. As may be seen in the accompanying color plate, the hafting styles of points burins were made on cover the wide spectrum of cultures from the early Archaic side notch to classic Hopewell points of the Middle Woodland.

The burin was fashioned by simply removing one or more burin flakes from one corner of the edge of the broken projectile blade. This produced an edge as thick as the piece but also a heavy sharp one which would not break under pressure. When the edge needed sharpened, a succeeding burin flake or flakes were removed thus producing a new working edge. In some mysterious fashion, the knapper had the uncanny ability to terminate the length of his burin flakes leaving characteristic stairstep-like scars on a tool which had been sharpened many times.

Even though burin faceting was apparently widespread phenomenon in the Archaic, it is also found extensively in Hopewell as evidenced by the many broken Middle Woodland points which were made into burins. A close examination of the multitude of broken projectile points found by collectors—those normally relegated to a cigar box—might reveal a few heretofore unknown burin tools.

The 'In Situ' Theory Revisited

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Introduction

Until very recent times, the "Iroquois Co-Tradition" has consisted of five different but similar and related traditions of Iroquoian cultural development. These traditions of Iroquoian development are: 1) the *Ontario Iroquois Tradition*, whose development through time terminates in the historic *Huron-Petun* and *Neutral* tribal configurations; 2) The tradition which terminates in the *Wenro* tribal configuration; 3) The tradition which terminates in the historic *Seneca-Cayuga-Susquehannock* tribal configurations; 4) The tradition which terminates in the historic *Onondaga-Oneida-Mohawk* tribal configurations; and 5) the tradition which terminates in the very early historic tribal configuration of the *St. Lawrence Iroquois.*

The Western Basin Tradition

Since 1972, ever increasing information has been gathered through excavation, analyses, and comparative studies for the region of N.W Ohio, S.E. Michigan and S.W. Ontario.

Comparison of the results of these studies with materials (ceramic and lithic), burial patterns and settlement-subsistence patterns of the "Ontario Iroquois Tradition" suggest that the prehistoric people who lived in the region surrounding the western end of Lake Erie were another pre-historic Iroquoian population who did not survive into historic times because they were forced out of the region of the western Lake Erie Basin into S.W. Ontario by about A.D. 1400. These people are believed to have vacated their traditional homeland because of pressures placed on them by intruding Upper Mississippian peoples of the *Sandusky Tradition* (Stothers and Pratt 1980).

The *Western Basin Tradition* people (formerly referred to as the "Younge Tradition") are believed to have moved eastward to join their cultural and linguistic "kinfolk," the Ontario Iroquois.

By utilizing the "Direct Historical Approach," the most recent time segment (Late Woodland period) can be successively traced backward in time through "evolutionary" cultural development to late Archaic times (i.e., ca. 1500 B.C.). Thus, the *Western Basin Tradition* has a long and continuous time sequence representing people who constituted another Iroquoian cultural tradition. As such, the "Iroquois Co-Tradition" is now understood to encompass at least six separate but related regional traditions.

Historical Background

In 1952, Richard S. MacNeish published his monograph *Iroquois Pottery Types* (MacNeish 1952) which documented his *'in situ'* hypothesis of cultural origins for the Iroquois of the northeastern woodlands of North America. This hypothesis was based upon Wedel's (1938) early attempt to demonstrate that prehistoric archaeological materials from a particular geographic region often were representative of a later historic tribal group (e.g., Plains Pawnee; historic Iroquoian tribal groups). Wedel's approach was formalized into a theoretical construct or technique for linking prehistoric configurations to early historic tribes by Julian Steward (1942), who labelled the technique the *Direct Historical Approach.*

MacNeish utilized this technique to trace the development of Iroquoian tribal configurations through time. It was through the analysis of pottery types from documented historic sites (of known cultural affiliation), and by connecting them with prehistoric sites (chronologically ordered on the basis of seriated or overlapping pottery types and ceramic trends), that the Iroquoian tribes of the American Northeast were demonstrated to have evolved *'in situ'*. In other words, MacNeish was able to demonstrate that the Iroquoian speaking tribes had evolved 'in place'. The *'in situ'* theory and its demonstration through the *'Direct Historical Approach'* dealt a death blow to the old and unfounded migration theories (c.f. Wright 1966: 3-5) of earlier times.

In the mid-1960's James E. Anderson undertook biological studies ('Discrete trait analysis' or the analysis of genetic characteristics in skeletal material), which specifically dealt with human skeletal populations. He utilized his study of discrete genetic trait analysis in conjunction with the *'in situ'* hypothesis (Anderson 1968) to demonstrate that the genetic characteristics of 'tribal' groups (breeding isolates) differed from each other across space and through time. In fact, the work of Anderson supported and indepen-

dently confirmed the earlier work of MacNeish.

Recent analyses have concerned the description and evaluation of biological parameters which characterize the osteological remains of the people who lived and died in northwestern Ohio and southeastern Michigan during the time period ca. A.D. 300-A.D. 1200. These osteological populations represent the Middle and Late Woodland time periods of the *Western Basin Tradition* (Stothers 1975, 1978). This cultural tradition represents a discrete ethnic group of prehistoric Iroquoian people who lived in the lands surrounding the western end of Lake Erie.

Osteological analyses suggest that these people were morphologically and genetically very close to other Iroquoian ethnic groups (Lozanoff and Stothers 1975, Stothers, Lozanoff and Baden 1978) such as the Ontario Iroquois, although they constituted a relatively discrete and circumscribed breeding isolate. The skeletal data furthermore suggest that biological continuity persisted through the Middle and Late Woodland time periods of the Western Basin Tradition. These conclusions, based on skeletal analyses, are supported by recovered archaeological cultural materials such as ceramics and lithics, as well as settlement and subsistence patterns (Stothers and Graves 1982, Stothers, Graves and Redmond 1982, Pratt 1981).

Conclusions

Cultural and biological evolution seem to indicate similar trends and patterns through time, while synchronic cultural and biological configurations seem to indicate clinal transformations. As such these patterns, configurations and temporal trends appear to be in mutual accord, further confirming the hypotheses (paradigms) of *'in situ'* cultural and biological evolution.

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Jones Site No. 1 Volunteer Salvage

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In October of 1979 a volunteer work force was assembled to salvage an archaeological site eligible for the National Register of Historic Places, the Jones Site #1 (33-Su-81). The site was located on private property subject to impending development which would result in the site's total destruction. With no federal involvement, it would be up to concerned individuals to salvage the site. The salvage effort was originally allotted time from October to mid-December. This article will highlight the volunteers and the results of their salvage.

The Jones Site #1 was found in the summer of 1978 as part of a phase II archaeological survey for the proposed relocation of State Route 8 in Summit County, Ohio. (Bush, 1978) Proposed improvements in this project entailed the construction of a four lane connecting highway. Phase II field investigations during the summer of 1979 resulted in the investigator's recommendation that the site be considered eligible for the National Register. (Bush, 1979). The site was subsequently determined eligible for inclusion on that Register following the review of its documentation.

The Call for Volunteers

Previous attempts at rallying volunteers on other salvage efforts had met with little success. Past steps relied on involving known contacts who had expressed interest to the investigator. This time a different approach was taken reaching out to a wider audience through newspaper exposure. The enormity of the response and the immense hours dedicated by this group deserves special analysis and recognition.

The exposure of the call for volunteers was run in the *Akron Beacon Journal* and the *Cleveland Press.* As the phone calls began, increased and then overwhelmed the investigator, a decision was made to gather as much information on this phenomenon as possible. A questionnaire was developed focusing on such characteristics as age, health, education, archaeological knowledge, probable work schedule, how one learned about the salvage, and what one wanted to learn from the experience. There were no specific hypotheses which were assumed prior to commencing.

An organizational meeting was held in a central location (Hudson, Ohio) to the majority of volunteers and within the general vicinity of the site. Along with a presentation and other materials, the questionnaire was passed out at this meeting. Anyone wishing to participate was required to complete and return the questionnaire as well as a legal release and a list of rules.

Some people expressed interest, came to the meeting, filled out forms, and later did not show for actual work. Others gave and gave of themselves. The investigator was impressed with the dedication of these people in the face of inclement winter weather. Individual skills and talents were employed wherever possible. Several people were organized into a telephone network responsible for geographic areas where messages could be relayed to the investigator about work dates or last minute changes in schedules. Others offered photocopying services at reduced rates. Specific individuals were skilled in photography while some had previous excavation experience and could be counted on to assist novices. Another talent which was employed immediately was that of welding. A family planned and constructed screens and tripods for use during the excavation.

Limited financial assistance was provided by Case Western Reserve University. Upon the realization that the excavation would be utilizing such a number of volunteers a request was placed for funding to cover supplies and expendable equipment. The University willingly assisted.

The Volunteers

Of the two newspapers that were used to recruit volunteers, the *Akron Beacon Journal* was selected by over 50% of the 124 respondents as where they had learned about the salvage. Only three people replied that they had seen the announcement in the *Cleveland Press.* The investigator attributes the influence of the *Beacon Journal* to the prominent placement of the article at the top of a first page of a suburban section as well as the site being more within the Akron vicinity. Word of mouth through an archaeological society or by friends passing on the information was named the second highest method by which people

learned about the salvage. Once into the salvage, a television segment and a follow-up newspaper article in the *Cleveland Press* were produced covering the volunteers and their efforts.

The greatest bulk of volunteers was evenly distributed through the ages of 19 to 60 years. Ninety seven percent assessed themselves to be in excellent to good health. Identification of health conditions such as allergies, heart problems or diabetes was sought. Concern was voiced that virtually unknown individuals would be on a site without access to phones and emergency aid. This category was not intended to block people from digging rather to make them aware of the primitive conditions. The investigator also wished to be knowledgeable of persons needing particular attention.

General education levels coupled with expressed interest in archaeology were seen as indicators of how instructions should be transmitted and information disseminated. Volunteers with college level education comprised 40% of all volunteers. The next largest group with 35% had attained high school matriculation. A sizeable percentage, 18%, had succeeded to graduate degree. Sixty eight percent implied a moderate knowledge of archaeology.

The following areas were presented as topics which could be expanded upon: Ohio prehistory, fieldwork, laboratory analysis techniques, and theory and preservation. Topics chosen of most interest were fieldwork and Ohio prehistory. Although laboratory techniques and theory and preservation were not as highly selected they did total positively in the mid 40% range. It was felt that these choices reflected several things: lack of experience which would eventually lead to laboratory work, an amateur orientation versus a professional one, and the initial attraction to volunteers—a chance to work on a "real" dig.

Volunteers were asked to list days available to work. Work forces would be in three to four hour shifts of mornings and afternoons. Since vehicle access to the site was limited by the landowners, crews were transported in groups by shifts.

In order to utilize the greatest work force over the restricted time schedule for salvage, a varying weekly work schedule was established. Both weekend days were always scheduled as these provided the largest crews of any time period. Smaller groups averaging 20% of the total volunteers were accessible during weekdays on both shifts.

Persons were expected either to sign up to work a week in advance or to arrange times with the telephone contacts. While a sizeable crew was planned on every scheduled work day the number of participants varied with the weather. On the more cold, snowy or rainy days there was a reduction in persons showing up. However, there was always enough volunteers to continue the effort.

The Site

Initial analysis of the Jones Site #1 indicated it was a multicomponent site with materials from the Late Paleo through Middle Woodland. (Bush, 1978) The majority of materials appeared to be of Late Archaic origin.

Because of the density of materials originally noted in 1978, the site area was revisited occasionally between then and the fall of 1980 when the salvage began. The site was surface collected systematically several times resulting in the recovery of hundreds of chert flakes and many worked chert implements. Due to the quantity of recovered material from this site and its proximity to the Jones Site #2 where subsurface features were encountered during intensive phase III testings, it was decided to salvage as much of the Jones Site #1 as time would allow.

With the funding made available by the University, the site was plowed and disced. Since the site area had been plowed for many years, this would not destroy valuable information. Instead, it would expose the maximum amount of material with the least amount of effort. Volunteers conducted a controlled surface collection of the entire site area. All materials recovered were recorded as to their location.

When this surface inspection was completed, we began stripping the topsoil to expose the subsurface. At first, we worked through the topsoil very carefully in order to recover the archaeological information it contained. All soil was screened through one quarter inch hardware cloth. This demonstrated the immense amount of material embedded in the top twenty centimeters. Finally, it was decided that this method was painstakingly slow. If continued, it would result in only a portion of the site area being salvaged.

Before the winter snows set in, the site area was stripped of all topsoil with the use of a front end loader. Although no major or unexpected discoveries were made, the stripping of the topsoil resulted in the location of almost 100 post molds and four larger pits. By this time winter was beginning. Unfortunately, it was too late to conduct any further excavations at the site.

As with many construction projects, one delay after another resulted in the site's availability for further excavation in the spring of 1981. This gave us the time necessary to examine several of the post molds and all of the pits that had been exposed the previous fall. The site was excavated by volunteers and the field school crew from the University.

This later work resulted in the recovery of 10,000 artifacts, mostly flint or chert flakes. Over three hundred chert tools were recovered. In the largest of the pits unearthed, one as yet unidentified fragment of bone was unearthed. Carbon samples were collected for dating.

The analysis of the Jones Site #1 material continues at the University. This article is not intended to be a site report, nor even to describe the materials or importance of the Jones Site #1. Rather, it documents and relays the importance of the volunteers who worked long, cold hours at the Jones Site so that part of the prehistoric record might be preserved for future generations to enjoy. In all, 2000 hours of volunteer time have been accumulated over the course of excavations at the Jones Site. This is an invaluable contribution made by unselfish individuals. They are commended for their work. We thank you.

Special thanks go to the landowner, who not only allowed the archaeological studies to continue but participated much of the time. Without his concern for the cultural materials there would have been no salvage effort.

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Fig. 1: Volunteers excavating during the early stages of the Jones Site #1 salvage.

Fig. 2: Volunteers exposing the subsurface in search of features.

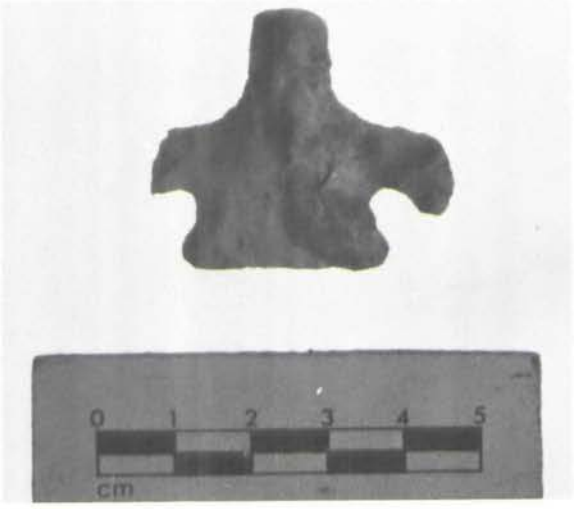

Fig. 3: An unusual chert drill or chisel from the Jones Site #1.

Fig. 4: Side-notched (hafted) scrapers from the Jones Site #1.

Fig. 5: Some of the many projectile points recovered from the Jones Site #1.

Selected Indiana Chert Types

by
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Introduction

Since 1963 I have been conducting an archaeological research program in the White River Valley of southwestern Indiana. My major research area consists of a contiguous seven county area along the West Fork of White River in Morgan, Monroe, Owen, Clay, Greene, Knox, and Daviess Counties (Map 1), with most of my research having been done in Greene County (Tomak 1970). In conjunction with this I have also been doing research in the Valley of the East Fork of White River from Daviess to Jackson County. In addition, in the 1960's I began a chert resource survey of Indiana in order to learn more about the cherts utilized by aboriginal peoples and to make archaeological application of the knowledge gained.

The purpose of this paper is to discuss some Indiana chert types which were utilized prehistorically in the White River Valley. Previous discussions of these materials occur in my Master's thesis (Tomak 1970:199-210). The treatments of cherts in the thesis and in this paper are based upon research I have conducted and collections I have made over the years as a result of my continuing interest in the chert resources of Indiana.

Harrodsburg Chert (Fig. 2)

The term Harrodsburg chert was used many years ago by Guernsey (1924). This material occurs as strata and masses in limestone and residually in the soil in the area of Monroe and Lawrence Counties and probably elsewhere farther south in Indiana. For example, what appears to be Harrodsburg chert has recently been reported to occur in a stream bed in Floyd County (Mitchell 1981). Harrodsburg chert presumably originates in what is or was termed Harrodsburg limestone and was apparently formed by replacement of limestone. It is a fossiliferous chert which presents an overall speckled appearance with streaks sometimes present. The fossils include crinoids and bryozoans. Many of the specks probably represent oolites. The overall color of this material includes shades of browns, grays, whites, reds, and sometimes bluish colors.

Indian Creek Chert (Fig. 3)

The name for this chert was supplied by Robert Edler of Oolitic, Indiana. He has used this term for years due to the occurrence of this material in the Indian Creek area of Greene, Monroe, and Lawrence Counties. The particular sample from which this chert is described comes from site 12Gr392 which appears to be a workshop site. It is located in section 23, T8N-R3W, along Richland Creek in Greene County, eight or nine miles north of the above mentioned Indian Creek area. This chert was also observed in the limestone adjacent to 12Gr392 and in the soil along the creek. It was the opinion of Henry Gray (personal communication) of the Indiana Geological Survey that this material comes from the Ste. Genevieve limestone. Indian Creek chert occurs as nodules and masses, and it grades from dull more coarsely textured material to that having a rather lustrous flinty look. The usual color varies from beige to buff to tan with brown sometimes present. Frequently it is variegated with shades of the foregoing colors, and dark gray or dark grayish purplish areas may be present. This chert can weather to darker shades, dark tan or brown, pinks, and reds. Beige can weather to buff. Not unusually, points made of this material have reddish edges, tips, barbs, or corners. If Indian Creek chert is heated in an oven, marked color changes occur. Beige, buff, and tan change to shades of reds, pinks, grayish pinks, lavender, and less often dark gray or dark grayish purplish colors. The original dark gray, dark grayish purplish, and some tan areas change to more purplish or somewhat violet colors. After the material is heated, the newly produced colors retain the pattern of the original colors. See Richland chert.

Richland Chert (Fig. 4)

The sample from which this chert is described also comes from site 12Gr392 adjacent to Richland Creek in Greene County. I have not located a natural source for this material. The color includes shades of pink, reds, and purplish colors. It is frequently variegated with these and sometimes dark grayish colors. In quality of material, texture,

and the pattern of the colors, Richland chert is like Indian Creek chert. Richland chert can be produced by heating Indian Creek chert in an oven.

Stanford Chert (Fig. 5)

The usual color consists of shades of medium grays, but lighter and darker shades occur. This material is frequently a mixture of the foregoing colors, may have streaks in it, and often has tiny white and gray specks in it. Sometimes there are inclusions of quartz crystals. Some artifacts made from Stanford chert have a lustre. I am not sure whether or not this is the result of heat treatment. It may be that the lustrous material occurs naturally. A location at which at least some of the variation in this chert occurs is the Dupe's Folly Cave area in section 24, T8N-R2W, a few miles southwest of Bloomington in Monroe County. It occurs in sizeable tabular pieces on the floor of the cave and in the soil adjacent to the cave. The pieces I collected varied from about 30 to 70 mm. in thickness. It was the opinion of Henry Gray (personal communication) of the Indiana Geological Survey that this chert probably occurs in the top of the St. Louis limestone or the bottom of the Ste. Genevieve limestone. I have recently located two sites at which most of the debris is Stanford chert and which have produced many bifaces, usually fragmentary, made from this material. Little else occurs at these sites. They may be workshop sites, and they are located in Lawrence County in sections 4 and 5, T6N-R1W.

Plummer Chert (Fig. 6)

This chert may occur naturally in the vicinity of sections 27, 28, and 32, T7N-R5W, near Plummer in Greene County. Although no natural deposits have been observed, some sites in that area produce many flakes and good sized pieces of this material. Much Plummer chert is present on site 12Gr393 in section 27, and this site appears to be a large workshop. I have not observed this chert to be particularly common in other areas of Greene County. Plummer chert is black with white and gray areas, streaks, and small specks. Frequently there are other softer areas of dull white, gray, or brownish material which resembles cortex. Some pieces contain brachiopod impressions. Professor Robert Pace (personal communication) of Indiana State University reports what sounds like similar chert from the area of Lieber State Recreation Area on the Owen-Putnam County line some 35 miles to the north of Plummer. It may be that these black cherts originate in the Ferdinand limestone. This limestone is described for Dubois and Spencer Counties in southern Indiana by Shaver et al. (1970:56-57) who report that it contains "black white-spotted fossiliferous chert." They also state that the Ferdinand, or what probably is the Ferdinand, is present in Owen, Greene, and Clay Counties.

Independence Chert (Fig. 7)

Independence chert (Tomak 1970:201), also known as Indiana Green, is one variety of Attica chert (Winters 1969:24-25). It is a tabular chert variegated with streaks and areas of green, grays, and whitish colors. The texture is frequently rather coarse, but finer textured better quality material also occurs. One source of Independence chert is located along the Wabash River in Fountain County, Indiana, in section 16, T22N-R6W, a few miles upriver from the Town of Independence. This location was reported by John Henry of West Lebanon, Indiana. Mr. Henry took an associate of mine, David Sonner, there, and the latter collected a chert sample for me. I subsequently visited the area myself. A great quantity of chert debris is exposed on the ground and in a stream bed over an area of at least several acres at the foregoing location. It is my understanding that the location has been used as an historic quarry. (In this regard Gorby (1886:82-83) refers to "Flint Bar" as being in that area and states that much chert is present and that it was utilized for road construction in the City of Lafayette. Winters (1969:24) mentions that John Henry reported that aboriginal quarry pits are visible in the area in question.

Harrison County Flint (Fig. 8)

This material has long been known as Harrison County flint, but it has also been referred to as southern Indiana flint, Indiana hornstone, and Wyandotte flint (e.g. Lilly 1937). Harrison County flint (or flints) occurs in Harrison County, Indiana, and aboriginal quarries are reported for that area (Fowke 1928; Guernsey 1937; Lilly 1937). It or similar flint is also present in some areas adjacent to Harrison County including Meade County, Kentucky (James Matthews, personal communication). Harrison County flint is an homogenous high quality material whose color consists of various shades of blues and grays. However, weathering can cause marked changes in the external color of this material. For example, it can weather from blue to gray, from blue to brown, from gray to dull white, and from gray to reddish brown (Tomak

1970:200). This flint is best known for its occurrence as nodules (some of which are quite large), but it also probably occurs both as masses and as layers. It evidently was formed in St. Louis limestone and/or Ste. Geneieve limestone and, besides occurring in place in limestone, is found in the soil and stream beds of the area. Harrison County or quite similar flint is present as nodules, masses, and layers in Wyandotte Cave just west of the Harrison County line in Crawford County (Tomak 1975). According to Richard L. Powell (personal communication) of the Indiana Geological Survey, the flint in Wyandotte Cave occurs in Ste. Geneieve limestone.

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Fig. 2 Harrodsburg Chert
Fig. 3 Indian Creek Chert
Fig. 4 Richland Chert
Fig. 5 Stanford Chert
Fig. 6 Plummer Chert
Fig. 7 Independence Chert
Fig. 8 Harrison County Flint

Radiocarbon Dates From the Brokaw Site

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PART II

Introduction

Beginning in 1974 a preliminary report on the Brokaw site (33-B1-6) was initiated in the *Ohio Archaeologist.* Since that time, other articles have followed in which specific topics have been discussed. Similarly, the focus of this paper will be the radiocarbon determinations received for the site. In view of the length of the report, however, it has been presented in two parts. Thus, Part I (Pickenpaugh, 1981), was concerned with describing each of the samples collected and the feature in which it was found, the feature type, associated artifacts, dating laboratory, radiocarbon dates, and a brief comment regarding the dates. Part II, appearing below, will focus on an application of Student's t-Distribution to the Brokaw radiocarbon determinations and the application of various conversion models to calibrate the Brokaw assays to calendar time. In the discussion section, a brief history is given of the development of the radiocarbon dating technique, the projected time frame during which the Brokaw site was settled, a reference to some of the problems related to radiocarbon and dendrochronological calibration dating, and some advice to those submitting charcoal samples to radiocarbon dating laboratories.

Student's t-Distribution—A Comparison of Radiocarbon Assays

In view of the varying radiometric dates received for the Brokaw site samples (Table 1), a total of five t-tests were performed. This procedure, based on the statistical theory of random errors, is here appropriate because it permits the comparison of one radiocarbon date with another. This, of course, may be accomplished by testing the hypothesis that the mean of one radiocarbon assay is equal to the mean of another. Since the dates represent samples, and not the population, random variability could account for any perceived difference. Conversely, though, the samples really could be different. Thus, statistical theory enables one to decide between two alternative interpretations. For a more detailed explanation and description of the test, and the statistical theory underlying it, see Thomas, 1979:201, 206-208 and Thomas, 1976:227-257. The five tests and their results appear below.

In the tests which follow, the first three compare two radiometric dates from the same feature; the fourth examines two dates from features in which one essentially overlies the other; and the last compares the earliest acceptable assay with the latest acceptable assay. Importantly, it has been noted that comparing two assays determined by different laboratories does not seem to significantly affect the values computed.

No.	Excavation Unit	Laboratory Number	Radiocarbon Date 5568-year half-life	
1	8-Q	DIC-391	360±110 B.P.	A.D. 1590±110
2	K-3	UGa-3943	390±70 B.P.	A.D. 1560±70
3	K-101	UGa-3429	405±65 B.P.	A.D. 1545±65
4	K-101	N-3483	460±55 B.P.	A.D. 1490±55
5	28-U	N-3481	505±75 B.P.	A.D. 1445±75
6	K-1	UGa-3430	520±65 B.P.	A.D. 1430±65
7	31-K	N-3482	525±75 B.P.	A.D. 1425±75
8	D-14	TEM-167	530±120 B.P.	A.D. 1420±120
9	1-P	TEM-185	590±80 B.P.	A.D. 1360±80
10	31-K	TEM-169	620±70 B.P.	A.D. 1330±70
11	D-16	TEM-168	720±100 B.P.	A.D. 1230±100
12	28-U	DIC-392	740±55 B.P.	A.D. 1210±55

Table 1. Sequence of radiocarbon dates from latest to earliest from the Brokaw site based on a half-life of 5568 years.

TEST 1. A comparison of the dates for DIC-392, 740±55 B.P. (A.D. 1210±55) and N-3481, 505±75 B.P. (A.D. 1445±75), from a fire pit in excavation unit 28-U, should indicate a minimal distinction between them. Nevertheless, a difference of 235 radiocarbon years may be observed. The question may therefore be asked, is this a significant difference? To answer the inquiry, a value for t must be computed and then compared to a fixed value of t. The formula for determining t is as follows.

$$t = \frac{X - Y}{S_{x\,y}}$$

(S_{x-y} is the standard error of the difference between sample means and is computed:

$$\sqrt{S_x^2 + S_y^2}$$

In this instance observed t has a value of 2.52, while t at the .05 level of error has an expected value of ±1.96. Since observed t is greater than expected t, the dates are presumably different. It is therefore the author's opinion that the Dicar date (DIC-392), the earliest assay reported for the site, is probably incorrect and may be too early by as much as a century. Much the same may be said for TEM-168, 720±100 B.P. (A.D. 1230±100), from a sandstone hearth in unit D-16.

TEST 2. A comparison of the radiocarbon determinations from UGa-3429, 405±65 B.P. (A.D. 1545±65) and N-3483, 460±55 B.P. (A.D. 1490±55), recovered from a sandstone hearth located in the southwestern quadrant of excavation unit K-101, should reflect nearly identical assays. Still, a difference of 55 radiocarbon years may be noted. The question may thus be asked, is this a significant difference? Again, to answer the inquiry, a value for t must be computed and compared to a fixed t value. In this case observed t, determined by the procedure outlined above, has a value of 0.64. Because observed t is considerably smaller than expected t, that is, ±1.96 at the .05 level of error, the dates for UGa-3429 and N-3483 are quite likely the same. The difference is due, presumably, only to sampling error.

TEST 3. A collation of the radioisotope assays for TEM-169, 620±70 B.P. (A.D. 1330±70) and N-3482, 525±75 B.P. (A.D. 1425±75), recovered from a large woodfire hearth in unit 31-K, should indicate similar results. Yet, a difference of 95 radiocarbon years may be noted. The inquiry may accordingly be made, is this a significant difference? In this instance, observed t, computed by the method outlined in test 1, has a value of 0.92. Because observed t is less than expected t, the dates for TEM-169 and N-3482 are probably the same. The difference, again, may be explained by sampling error.

TEST 4. A comparison of the carbon-14 dates for UGa-3430, 520±65 B.P. (A.D. 1430±65), from a midden and living floor between the 20 to 30 centimeter level in excavation unit K-1, and UGa-3943, 390±70 B.P. (A.D. 1560±70), from the 40 to 50 centimeter level of a relatively large, amorphously-shaped hearth underlying the midden and living floor in K-3, reflects a difference of 130 radiocarbon years. Unfortunately, however, the dates for the samples are stratigraphically reversed. That is, the lower level date is more recent in time than the upper level. Nevertheless, because the concern is with random sample variability, the question may still be asked, is this a significant difference? Here, observed t, determined by the *procedure* noted in test 1, has a value of 1.36. Because it is less than expected t, the dates for UGa-3430 and UGa-3943 could conceivably be the same. Clearly, though, this conclusion holds true only if the deposits in question should have accumulated over a relatively short amount of time.

TEST 5. A collation of the radioistotope determinations for TEM-169, 620±70 B.P. (A.D. 1330±70), perhaps the earliest acceptable assay for the Brokaw site (see test 3), and UGa-3429, 405±65 B.P. (A.D. 1545±65), perhaps the latest acceptable assay (see test 2), indicates a difference of 215 radiocarbon years. Again, because we are dealing with random sample variability, the inquiry may thus be made, are the dates really different? In this instance, observed t, computed by the method outlined in test 1, has a value of 2.25. Since observed t is greater than expected t, the dates for TEM-169 and UGa-3429 are probably different. Each date, accordingly, quite likely represents a different period of habitation.

Radiocarbon Assays and Calendar Time

In an attempt to firmly anchor the Brokaw site in time and to resolve the question of possible Euro-American contact during the early historical period, various conversion models and statistical procedures have been applied to the Brokaw dates. These models and procedures were of course designed to improve the accuracy and utility of the radiocarbon dating technique and to convert radiocarbon assays to calendar time. Thus, it is

generally agreed that the weighted average 5568±30-year half-life of radiocarbon, initially proposed by Libby (1952:35, 41), is incorrect and the more accurate 5730±40-year mean half-life value should be employed by individual users in its stead (Godwin, 1962:984; Michels, 1973:150). Accordingly, a conversion may easily be made by multiplying the conventional B.P. (before present, that is, A.D. 1950) date by a factor of 1.030 (Ralph, Michael, and Han, 1973:1). Needless to say, such a correction necessarily has the effect of making an assay earlier in time.

In this case though, as a result of the Brokaw dates being relatively late on the prehistoric time horizon (Table 1), a conversion to the more recently established 5730±40-year half-life alters the radiocarbon determinations only 10 to 20 years (Table 2). The corrections, consequently, make the occupation of the site occur at only a slightly earlier point in time. Indeed, this remains true even with a possible minor alteration of the standard deviations (Godwin, 1962:984).

No.	Laboratory Number	Radiocarbon Date 5730-year half-life		Calendar Date
1	DIC-391	370±110 B.P.	A.D. 1580±110	A.D. 1545±165
2	UGa-3943	400±70 B.P.	A.D. 1550±70	A.D. 1525±145
3	UGa-3429	415±65 B.P.	A.D. 1535±65	A.D. 1500±140
4	N-3483	475±55 B.P.	A.D. 1475±55	A.D. 1455±135
5	N-3481	520±75 B.P.	A.D. 1430±75	A.D. 1410±145
6	UGa-3430	535±65 B.P.	A.D. 1415±65	A.D. 1410±140
7	N-3482	540±75 B.P.	A.D. 1410±75	A.D. 1390±145
8	TEM-167	545±120 B.P.	A.D. 1405±120	A.D. 1390±175
9	TEM-185	605±80 B.P.	A.D. 1345±80	A.D. 1345±150
10	TEM-169	640±70 B.P.	A.D. 1310±70	A.D. 1300±140
11	TEM-168	740±100 B.P.	A.D. 1210±100	A.D. 1215±160
12	DIC-392	760±55 B.P.	A.D. 1190±55	A.D. 1215±135

Table 2. Sequence of radiocarbon and dendrochronologically calibrated dates from latest to earliest from the Brokaw site based on a half-life of 5730 years.

It has been determined, however, that radiocarbon years are frequently not in full accordance with sidereal years. This discrepancy may be attributed to the fact that the steady-state condition of the atmospheric inventory of carbon-12 and carbon-14, on which the technique largely depends, has varied through time (Olsson, 1970). Such a difference has been clearly demonstrated by the radiocarbon analysis of wood of historically known age and of dendrochronologically dated wood samples (Michael and Ralph, 1970:109-120). Thus, as the true age of the latter can be established by cross-referencing specimens to within a single year (see LaMarche and Harlan, 1973:8849-8858 or Nature 248, No. 5444, March 8, 1974:104-105), it has been possible to use bristlecone pine (Pinus longaeva/Pinus aristata) to calibrate the radiocarbon time scale from as early as 5400 B.C. to as late as A.D. 1600. Samples more recent in time, though, necessarily present special problems. This is, of course, due to the increase in the amount of radiocarbon-free carbon dioxide emitted into the atmosphere with the combustion of fossil fuels that occurred subsequent to the inception of the Industrial Revolution (Suess, 1953:52-56; 1954:5; 1955:415-416; Houtermans et al., 1967:57-68) and to the more recent explosion of thermonuclear devices (Godwin, 1959:1366; 1962:-944), which, conversely, has more than offset the previously observed carbon-14 dilution (De Vries, 1958:95). The dendrochronological calibration of the radiocarbon dates from the Brokaw site to calendar years, based on the conversion format of the Laboratory of Isotope Geochemistry, University of Arizona (see Damon, Ferguson, Long, and Wallick, 1974:-350-366), is presented in Table 2. A brief description of the procedures employed and their application to an example appear below.

To compute a dendrochronologically calibrated age from an uncorrected radiocarbon assay, one locates in the appropriate column(s) of the first 4 of the University of Arizona conversion table, depending on the half-life used, the 2 numbers the uncorrected assay lies between. The calibrated dates are in the fifth and sixth columns and the corrected date is determined by interpolation. The standard deviation of the corrected value appears in the seventh. For example, UGa-3430 dates to 520±65 B.P. (A.D. 1430±65) by the Libby

half-life. This assay lies between 498 B.P. (A.D. 1452) and 522 B.P. (A.D. 1428) of columns three and four. These numbers correspond to 527 B.P. (A.D. 1423) and 549 B.P. (A.D. 1401) of the calibrated date columns. The correct interpolated date is thus 538 B.P. (A.D. 1410), while the combined standard deviation (o_c), determined by computing the square root of the sum of the variances (trend error and experimental error, plus $(120)^2$, if the C^{13}/C^{12} ratio (see Willis, 1970:51) of the counting sample is unknown), is as follows:

1. $o_c = \pm (250)^2 + (o_u)^2 + (120)^2$
2. $o_c = \pm (65)^2 + (38)^2 + (120)^2$
3. $o_c = \pm 140$ years.

Again, in general, the (mean) corrected dates indicate that the site was inhabited at a slightly still earlier point in time. In the main, the application of the University of Pennsylvania's MASCA calibration curve (Ralph, Michael, and Han, 1973:1-20) to the Brokaw dates supports this observation (data not presented).

Discussion

Carbon-14 as an absolute dating technique is now a full three decades old. From nearly its inception, in view of its potential for measuring time, concerted efforts have been made to determine its half-life. In 1952, 5568±30, the weighted mean of the three values 5580±45 (Engelkemeir et al., 1949:1825; Engelkemeir and Libby, 1950:553), 5589±75 (Jones, 1949:885), and 5513±65 (Miller et al., 1950:-715), was established as the most probable half-life value. In 1962, and again in 1965, at the Fifth and Sixth International Radiocarbon Dating Conferences, it was agreed that 5730±40, the average of 5760±50 (Mann et al., 1961:57), 5780±65 (Watt et al., 1961:68), and 5685±35 (Olsson and Karlen, 1963:3; Olsson et al., 1962:237), was the best value available. Nevertheless, as it was anticipated that additional research would lead to an even more accurate determination for this physical constant, it was advised that radiocarbon dates continue to be reported on the basis of the Libby half-life (Godwin, 1962:984; Johnson, 1965:1326). Unfortunately, even today, we are no closer to arriving at such an age, for international agreement has yet to be reached between the United States, England, and the Soviet Union (W. B. Mann, personal communication, October 1981).

Two equally important factors of the dating technique, initially thought to be essentially constant for the last 10 or 20,000 years (Libby, 1952:4-5; 1956:99-102), or more (Libby, 1952:8; 1961:622; 1967:6, 13), are the cosmic ray production of radioactive carbon dioxide and the stability of the carbon reservoir. If not by 1960, then certainly by 1965, the radiocarbon analysis of materials of known age—dendrochronologically dated wood and dated archaeological material—had basically demonstrated variations through time (Willis et al., 1960:1-4; Godwin, 1962:944; Suess, 1965:-5937-5952). What followed was a sequence of development of dendrochronological calibration systems of the radiocarbon time scale culminating in those such as are used here.

Thus, the various conversion models and statistical procedures applied to the Brokaw dates were fundamentally designed to improve the accuracy and utility of the carbon-14 dating technique and to correct radiocarbon assays to solar years. In this regard the application of Student's t-Distribution to the Brokaw dates suggests that four radiocarbon assays may be in error. They are the two earliest, DIC-392 and TEM-168, and the two latest, DIC-391 and UGa-3943 (see Tables 1 and 2), while the remainder appear to be acceptable. Accordingly, TEM-169 and UGa-3429, the earliest and latest acceptable assays, respectively, indicate that the maximum dendrochronologically calibrated time frame within which the Brokaw site was occupied spans the period from A.D. 1300±140 to A.D. 1500±140 years (see Table 2). That is, from A.D. 1160 to A.D. 1640. The sigma figures, of course, represent only one standard deviation (67 percent) from the mean dates (Thomas, 1979:200-201) and would, correspondingly, have to be doubled in order to represent two (95 percent). In this instance, however, it is the author's view that one standard deviation of the dendrochronologically calibrated assays is, de facto, equivalent to two standard deviations from the mean, since these particularly high sigma figures were derived by computing the combined standard deviations. Clearly, the time span from A.D. 1160 to A.D. 1640 is considered the maximum time period during which the occupation of the Brokaw site took place. Significantly, within this overall time range occur four radiometric assays, N-3481, UGa-3430, N-3482, and TEM-167, representing three radiocarbon laboratories, whose mean corrected dates cover a mere 20 years (see Table 2). By using the original sigmas assigned by the respective laboratories to N-3481 and TEM-167, it may be suggested that the successive occupations of the Brokaw site took place between A.D. 1270 and A.D. 1485, although the mean dates, if accurate, suggest late fourteenth and early fifteenth centuries.

Hence, vis-à-vis the European discovery of the Americas, the calibrated dates suggest that the occupation of the Brokaw site post-dates any Viking contact along the northeast coast of North America during the eleventh century, was perhaps contemporaneous with the arrival of the Spanish and Portuguese in the fifteenth and sixteenth, and predates French and English exploration of the interior of the North American continent during the seventeenth. Clearly, the suggestion that the recovery of a button of English manufacture dating to the early nineteenth century may have been contemporaneous with native American settlement of the site (Pickenpaugh, 1979) appears to be entirely unfounded.

The reader must be advised, however, that the picture painted thus far of the carbon-14 dating technique is incomplete, as other possible sources of error exist. Indeed, a multiplicity of additional possible causes may be cited. They are: (1) isotopic fractionation (Willis, 1970:46-47; Ralph, 1971:15, 25; Faure, 1977:311-312), (2) the statistical nature of radiocarbon dates (Thomas, 1976:244; 1979:-200-201), (3) De Vries effect (De Vries, 1958), (4) humic acid (Ralph, 1971:12, 14), (5) laboratory dating equipment (Olsson, Karlen, Turnbull, and Prosser, 1962:237-255), (6) field collecting and laboratory errors (Dyck, 1967:-349; Ralph, 1971:8-9, 12; Fletcher, 1975:-25-26), (7) samples 40,000 years old and older are easily contaminated with minute amounts of modern carbon (Ralph and Michael, 1974:-554), and (8) correction factors (Thomas, 1979:203).

With regard to the last variable the fact that the ascribed time of occupation of the Brokaw site, and the attendant interpretations, are based principally on dendrochronologically calibrated carbon-14 dates essentially demands that this time-correcting technique also be the subject of examination. Accordingly, a review of the relevant literature indicates that there are indeed several problems. There is, for example, (1) incompatibility of dendrochronologically calibrated carbon-14 dates and Egyptian historical dates during parts of the first, second, and third millenniums B.C. (McKerrell, 1975:57-59), (2) the statistical uncertainty in the calibration is, of necessity, greater than the uncertainty assigned to the raw assay (Fletcher, 1975:26), (3) attempts to 'smooth' the bristlecone pine calibration curve may be inappropriate (Baxter, 1974:93; Burleigh et al., 1973:309, 314, Burleigh, 1975:7-8; Ottaway and Ottaway, 1975:28-38), and (4) the special nature of the bristlecone growth conditions may cause inaccuracies in the calibration system (Baxter, 1974:93; Burleigh, 1975:7). Together, these factors suggest that the state of the art of the dendorchronological calibration of the radiocarbon time scale is such that any conclusions drawn as a result of its application to data must be regarded as provisional.

Finally, the author would like to offer some advice to those submitting charcoal samples from single phase sites to radiocarbon dating laboratories. One, at a minimum date four or five samples, for the results of only one or two may be misleading. Two, if possible, submit four or five samples to several laboratories. This will be sufficient to establish consistency of assays from each laboratory and, combined, they may suggest a mean date of cultural activity. Three, each sample weighing 25 grams or more should be divided, with half submitted to one laboratory and the remainder to yet another. This will permit cross-checking of laboratories and also allow rejection of errant determinations. Four, the assays may display a 'clustering effect' by laboratory, thereby indicating that there are minor differences between them, as each laboratory may date consistently higher or lower than another. And, five, perform a t-test on the assays to determine if the difference between the dates is significant or not.

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The Demon of Effigy Pipes

by D. R. Gehlbach, 3450 Sciotangy Dr., Columbus, Ohio

The Fox Field site in Mason County, Kentucky, which lies just south of the Ohio border, produced extensive Fort Ancient artifactual remains. The variety of pipe forms occurring at this site are typical of Fort Ancient focus stylization. Similar site material is found at the neighboring Hardin Village in Kentucky and in the Feurt and Baum middens in Ohio. Most pipe specimens are simplistic in design and apparently were crafted with an eye on practicality and extended use. Most could be classified as individual possessions while the diverse application of design decoration suggests that multiple members of the community participated in their manufacture.

Pictured is one of the more interesting effigy pipes found at Fox Field. The writer has dubbed this example the Demon Pipe based on the portrayal of a scowling face with a horn-like decorative motif. The effigy is carved in three dimensional relief on the side of the ovoid-shaped bowl facing away from the smoker. Utilizing a porous sandstone matrix, this pipe form is symbolic of the late prehistoric period in terms of the rather crude workmanship.

For additional information on similar pipes from this well known Kentucky site consult the recent publication by S. A. Glass entitled, "Return To Fox Field".

Fig. 1 (Gehlbach) So-called Demon effigy pipe from Fox Field, Mason County, Kentucky.

A Quartzite Bullfrog Effigy Pipe

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Among the large number of late prehistoric pipes are several examples which depict members of the amphibian family. Various unidentifiable species of toads and frogs are portrayed with varying degree of realism and apparently there were models in abundance inhabiting the local environment. Large blocks of quartzitic sandstone which were the result of erosion and water induced breakdown were readily available as a crafting material, permitting the primitive artist to produce his characterization without extensive preparation. It is my belief that many of these pipes were treated as community or family property since they were transported considerable distances from their point of manufacture. As their owners migrated to more fertile food resources, they were probably carried along with other possessions and then at some point were left behind. Why they were abandoned or lost in widely separated geographical areas is not known.

The bullfrog shown in Fig. 1 was a surface find in Butler County, Ohio. It is somewhat aberrant in form, particularly the drilling technique. Heavily tapered stem and bowl cavities reflect the difficulty of working down the dense material. The piece is quite bulky which may account for its being left behind by an overburdened traveler.

There has been considerable discussion with regard to the age and cultural affiliation of this pipe form. It is the writer's contention that these effigies are the product of Mississippian people who migrated into the Ohio River basin. At what time this migration took place is not clearly known, but it was probably not before 1,500 AD. This supposition is based on the relative dating of neighboring Mississippian communities in the floodplain of the Ohio River. There seems to be no direct affiliation with contemporary Fort Ancient villages along the Ohio River.

Most of the massive effigy pipes of this period have been found on or near the surface and were collected many years ago when farm ground was first broken. They are now quite rare and are viewed as a highly collectable pre-Columbian artifact form.

Fig. 1 (Gehlbach) Bullfrog effigy pipe from Butler County, Ohio.

Patience Pays Off

By Alva McGraw, 1177 Eastern Ave., Chillicothe, Ohio

In the accompanying photographs are shown the broken parts and the assembled pieces of a fine two-hole gorget. It was found over a period of time in seven pieces which strangely were all about the same size.

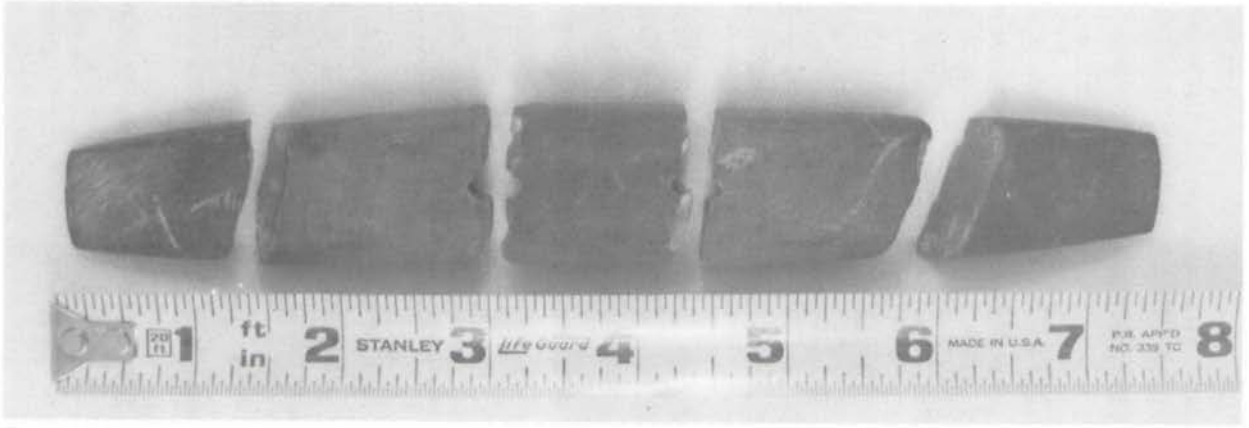

Fig. 1 (McGraw) Gorget showing the seven unassembled pieces. From left to right the order of discovery is third, fifth, first, first, fourth, fourth, second.

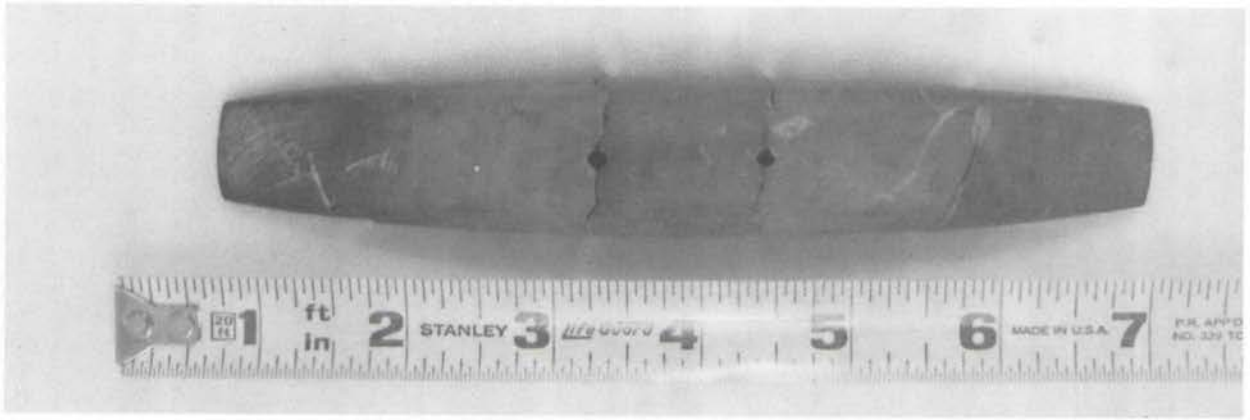

Fig. 2 (McGraw) Two-hole gorget nearly seven inches long reassembled.

Announcement

THE 54th ANNUAL MIDWEST ARCHAEOLOGICAL CONFERENCE
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Northern Ohio Adenas

by
John R. Heath
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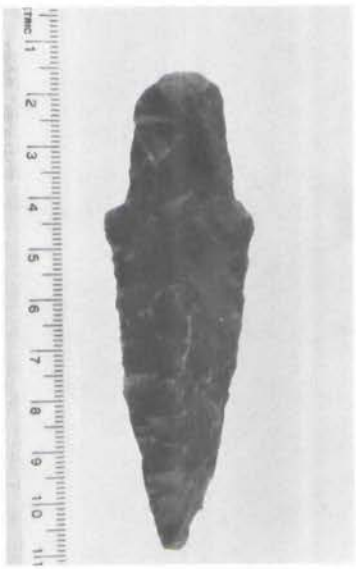
The three points pictured (Fig. 1-2-3) are typical of Adena spear points found along the headwaters of the east branch of Black River. Although found sparingly in this area, these artifacts are of as high quality as any found in central or southern Ohio.

Surface collections from this area seem to have more colorful points than many collections picked up much closer to Flint Ridge. This has always been a mystery to me. I would appreciate any comments on this.



(Fig. 1) point (a) 3¾ in. long—1¼ in. wide at ears—½ in. thick. Made of glossy grey Coshocton flint. Sullivan Twp., Ashland Co., Ohio.

(Fig. 2) point (b) 3⅞ in. long—1½ in. wide at ears—5/16 in. thick. Made of red, tan, & white Flint Ridge chalcedony. Huntington Twp., Lorain Co., Ohio.

(Fig. 3) point (c) 3½ in. long—2 in. wide at ears—⅜ in. thick. Made of pink & white Flint Ridge chalcedony. Jackson Twp., Ashland Co., Ohio.

Book Review

Digging Up Bones

By D. R. Brothwell—Published in cooperation with the British Museum. Cornell University Press, 124 Roberts Place, Ithaca, New York 14850

208 pages with accompanying illustrations Price $14.95

This comprehensive publication on the human skeleton is probably one of the most complete books of its kind available to the layman. Despite the fact that it deals primarily with European examples of bone material, nearly all the data on bone disease and pathology in general will be helpful to the reader who is interested in learning more about the human skeleton. While a Canadian publication of some years ago—I don't recall its title—proved to be one of the best for the beginner, this book goes into detail on nearly every aspect of disease, dentition, trauma, diet and even such evidence such as deformation and trephining. *Digging Up Bones* will prove particularly helpful for those who have an initial familiarity with human skeletal material but who desire to learn more.

Robert N. Converse

Wise Rockshelter—A Multicomponent Site in Jackson County, Ohio by Jon Oplinger

Kent State Research Papers in Archaeology #2, Kent, Ohio 44242

61 Pages Price $4.50

The Wise Rockshelter is located near Salt Creek in Turkey Hollow, Jackson County, Ohio. It is one of numerous such formations used by prehistoric man in southeastern Ohio. The site was excavated by the author and fellow students from Kent State University. As with many of these shelters the predominate cultural debris could be related to the Late Woodland period although a number of Archaic projectile points were also found in the deeper levels of the midden. This report is well written and reviews the lithic, ceramic, stone and bone assemblages in detail. Unfortunately, not all the artifacts are pictured, the economy of minimal pictures in many of these reports is a short-sited one in the opinion of the reviewer. Also unfortunate is the use of the type name "Matanzas" (whatever that is) to describe an Archaic side notched point on page 27.

In total, however, the report is a good one even though it seems to stress the Late Woodland aspects of the shelter to the detriment of the obvious Archaic occupation.

Robert N. Converse

The Tower Site and Ohio Monongahela by Jeffrey D. Brown

Kent State Papers in Archaeology #3, Kent, Ohio 44242

96 pages Price $6.00

The Tower site is one of a number of late sites in eastern Ohio which relate to the Monongahela complex found in the upper Ohio valley of Ohio, West Virginia and Pennsylvania. The ceramic, flint, stone, bone and shell artifacts from the site are studied in detail and are compared with other Monongahela locations in the area. Surprisingly, only 55 flint pieces were found which could be identified, a fact in direct contrast to the rather abundant flintwork from equivalent sites. The report is well written and well illustrated. The continual references to "looters" and "potholers" seems somewhat overdone especially when it is equated with the massive and irreversible obliteration done by strip mining in the area.

Raven Rocks—A Specialized Late Woodland Rockshelter Occupation in Belmont County, Ohio

By Olaf H. Prufer—97 pages—price $6.00

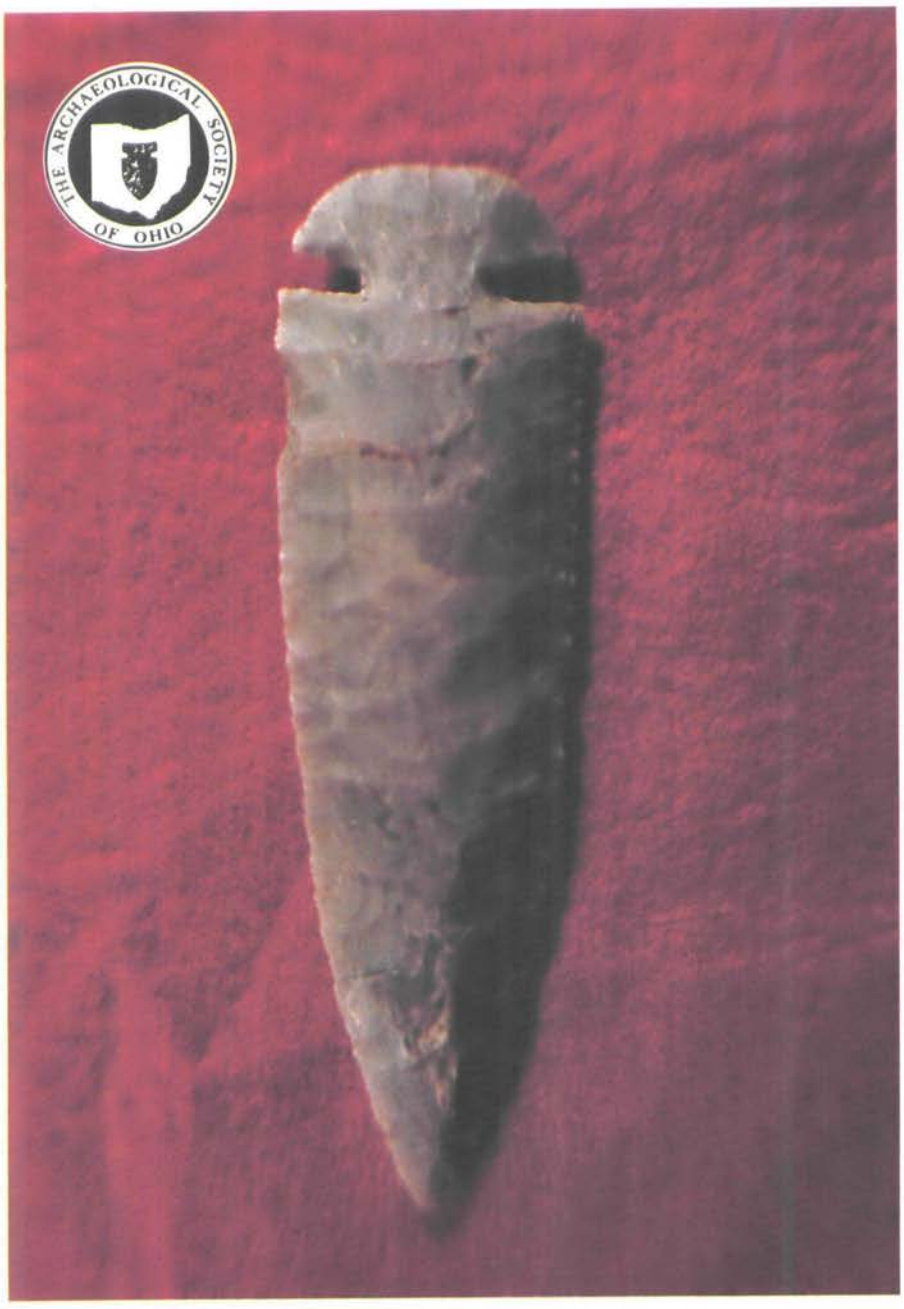
Kent State Research Papers in Archaeology #1, Kent, Ohio 44242

This booklet is the published results of field work done in Belmont County in 1969 and 1970. It is heartening to see such information made public, even after eleven years, on a site situated in an almost archaeologically unknown part of Ohio. Raven Rocks presents a nearly pure concentration of Late Woodland material including ceramics, flint projectile points and tools, and bone tools. The site has been dated at between roughly 800 AD and 1100 AD and closely ties in with similar shelters excavated in southeastern Ohio by the author and others in the 1960's.

The book exhaustively explores all facets of evidence from the shelter, from the lithic industry flora and to faunal remains. While not all readers will agree with some of the conclusions in the summary, they are well thought out and fairly presented. Nevertheless, some of the theories will provide food for thought and, hopefully, a basis for future work.

BACK COVER

A surface hunt on a rainy afternoon January 31, 1982, produced this outstanding dovetail for John Varnado of Columbus, Ohio. It is made of heavily patinated Flint Ridge chalcedony and measures 5⅝ inches in length.



OBJECT OF THE SOCIETY

The Archaeological Society of Ohio is organized to discover and conserve archaeological sites and material within the State of Ohio, to seek and promote a better understanding among students and collectors of archaeological material, professional and non-professional, including individuals, museums, and institutions of learning, and to disseminate knowledge on the subject of archaeology. Membership in this society shall be open to any person of good character interested in archaeology or the collecting of American Indian artifacts, upon acceptance of written application and payment of dues.